BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM
WASHINGTON, DC 20551

Supervisory Stress Test Model Documentation

Aggregation Models

October 2025

This document summarizes the aggregation models that the Board of Governors of the Federal Reserve System (Board) intends to use in the 2026 Supervisory Stress Test. The following sections provide an overview of the Balances, Retained Earnings, Provisions, and Capital Models. Each section includes a summary of the model, model components, and alternatives considered, along with other model-specific details. Documentation on the other models that the Board intends to use in the 2026 Supervisory Stress Test is available at the following link: https://www.federalreserve.gov/supervisionreg/dfa-stress-tests-2026.htm

Table of Contents

A.   Balances Model

i.   Statement of Purpose

In order to implement the credit supply maintenance policy in the Policy Statement[1], the supervisory stress test assumes that a firm's projected balance sheet is held constant throughout the projection horizon. While an individual firm might assume that it reacts to rising losses by sharply restricting its lending (*e.g.,* by exiting a particular business line), the banking industry as a whole cannot do so without creating a "credit crunch" and substantially increasing the severity and duration of an economic downturn. The assumption that the magnitude of firm balance sheets will be fixed in the supervisory stress test ensures that covered companies cannot assume they will "shrink to health," and serves the Board's goal of helping to ensure that firms remain sufficiently capitalized to accommodate credit demand in a severe downturn. This assumption also allows supervisors to evaluate the health of the banking sector as firms continue to lend during times of economic stress. In addition, by precluding the need to make assumptions about how underwriting standards might tighten or loosen across firms during times of economic stress, the Board follows the principle of consistency and comparability and promotes consistency across firms, as described in the Policy Statement.

To facilitate the flat balance sheet assumption, the Board uses the Balance Sheet Line-Item Projections Calculator (Projections Calculator). The Projections Calculator collects a comprehensive set of balance sheet and risk-weighted asset items from firms' regulatory reports and aggregates them to serve as inputs to the Board's supervisory stress testing models. The Board generally projects that a firm takes actions to maintain its current level of assets, including

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[1] *See* 12 CFR 252, Appendix B.

its securities, trading assets, and loans, over the projection horizon. The Board assumes that a

firm's risk-weighted assets and leverage ratio denominators remain unchanged over the

projection horizon except to account for changes primarily related to the calculation of

regulatory capital or the Board's regulations. The supervisory credit risk models used in the

stress test calculate portfolio-level loss rates for loan and lease losses, while the pre-prevision net

revenue models calculate the ratio of the respective income or expense component divided by the

corresponding balance sheet asset or liability level. These loss rates and growth ratios are

multiplied by the aggregated balances calculated by the Projections Calculator to calculate losses

and revenue used for calculating pre-tax net income in the supervisory stress test projections.

ii.   Model Specification

The Projections Calculator sources data from the Consolidated Financial Statements for

Holding Companies (FR Y-9C), Regulatory Capital Reporting for Institutions Subject to the

Advanced Capital Adequacy Framework (FFIEC 101), and FR Y-14Q, Schedule M (Balances)

regulatory reports, and it makes certain modifications to the data to facilitate compatibility with

the downstream models, as described below. For example, the Projections Calculator converts

data obtained from the FR Y-9C and FFIEC 101, which is originally reported in thousands of

U.S. dollars, into millions of U.S. dollars. The instructions for the FR Y-9C, FFIEC 101, and FR

Y-14Q regulatory reports require firms to report certain items as blank if they do not apply for a

given firm. The Projections Calculator replaces missing values in any of the regulatory reports

with zeroes, as needed.

The Projections Calculator also renames and aggregates regulatory reporting items for

use in other supervisory stress testing models. For example, total domestic first lien residential

mortgages are aggregated from corresponding items on FR Y-14Q, Schedule M (Balances),

specifically items 1.a.(1)(a) and (b), Columns A and B. The first lien model uses this aggregated domestic first lien amount to calculate projected losses on domestic first lien loans (by multiplying the aggregated domestic first lien amount by the loss rate calculated for the portfolio). Other categories are similarly aggregated, including other total loans, accrual loans, and fair value loans.

The supervisory stress test models related to credit risk losses primarily source inputs from the FR Y-14 data in order to have adequate information for assessing risk and projecting loss rates at the portfolio level, which is not always available from the FR Y-9C report. These loss rates are then multiplied by aggregated balance sheet items on FR Y-14Q, Schedule M (Balances), as projected by the Projections Calculator, to calculate total dollar amounts of loan and lease losses. The supervisory PPNR models rely on several data sources to project growth ratios. Each projected ratio is multiplied by its corresponding scaling balance from the FR Y-9C, as projected by the Projections Calculator, to calculate the total pre-provision net revenue included in pre-tax net income. To ensure that the dollar value of the portfolio of loans used to project revenue is consistent with the dollar value of the portfolio used to project loan losses, the Projections Calculator constructs a scaling factor and applies it to balances aggregated from FR Y-14Q, Schedule M (Balances). The purpose of the scaling factor is to ensure that the loan values reported on FR Y-14Q, Schedule M (Balances) are equal to the value of total loans as reported on FR Y-9C, Schedule HC-C (Loan and Lease Financing Receivables). The loan amounts constructed from FR Y-14Q, Schedule M (Balances) data are adjusted by the scaling factor.

The scaling factor is generated for each firm based on the amount of total loans the firm reports on Schedule M, as well as the combined amount of unearned income from loans and

leases (FR Y-9C, Schedule HC-C, item 11) and total loans and leases (FR Y-9C, Schedule HC-C, item 12). The FR Y-9C, Schedule HC-C instructions generally require that a firm report loan balances net of unearned income, and if a firm does include unearned income in loan balances, the unearned income is subtracted via item 11 before loan balance items are summed to calculate item 12. The FR Y-14Q, Schedule M (Balances) instructions require a firm to report balances as they are reported on FR Y-9C, Schedule HC-C. Therefore, to account for instances where unearned income is reported in FR Y-9C, Schedule HC-C, item 11, the scaling factor calculation adds back unearned income to the amount reported in FR Y-9C, Schedule HC-C, item 12.

Equation A1 - Scaling Factor

$$Scaling\ factor = \frac{Total\ loans\ reported\ on\ the\ FR\ Y\text{-}9C\ +\ Unearned\ Income\ reported\ on\ the\ FR\ Y\text{-}9C}{Total\ loans\ aggregated\ from\ Schedule\ M.\ 1\ of\ the\ FR\ Y\text{-}14Q}$$

Total loan amounts generally align between FR Y-14Q, Schedule M (Balances) and FR Y-9C, Schedule HC-C, meaning that the scaling factor should be close to 1, as described in more detail below. In general, loan items on FR Y-14Q, Schedule M (Balances) are reported at more granular levels than loan items reported on FR Y-9C, Schedule HC-C, and are reported in millions of U.S. dollars. By contrast, items on FR Y-9C, Schedule HC-C are reported in thousands of U.S. dollars. The instructions for each report provide guidance on rounding. For example, the FR Y-9C instructions state that "Total assets" (FR Y-9C, Schedule HC, item 12) and "Total liabilities and equity capital" (FR Y-9C Schedule HC, item 29), which must be equal, must be derived from unrounded numbers and then rounded to ensure that these two items are equal as reported. The instructions for the reporting forms also indicate how firms' balance sheet

breakout items should reconcile with aggregated items. The rounding and aggregation rules can sometimes result in misalignment between total loan balances on the two regulatory reports. Most often, these discrepancies arise from rounding differences between the two reports.

If the total loans and leases reported on FR Y-14Q, Schedule M (Balances) and the combined amount of unearned income from loans and leases and total loans and leases on FR Y-9C, Schedule HC-C match, the scaling factor will equal 1, so the expectation is that it will be close to 1 for all firms in most circumstances. The scaling factor is used as a monitoring tool for the Projections Calculator. If a scaling factor deviates from 1 by more than 0.001, the Board may require a firm to resubmit its FR Y-9C or FR Y-14Q report. Otherwise, aggregated loan balances from FR Y-14Q, Schedule M (Balances) are multiplied by the scaling factor to calculate inputs for supervisory credit risk models.

The Projections Calculator methodology, by design, does not capture or reflect the actual expected evolution of balances at individual firms or in the banking industry under stress. Since there are no statistically calibrated parameters, no back testing or sensitivity testing is performed to monitor performance over time. Instead, the calculator aggregates line-items together and then holds those values constant in each quarter of the projection horizon.

iii.   Alternatives Considered

The Board considered two alternatives for the Projections Calculator. First, it considered removing the flat balance sheet assumption. Instead, the Board could assume that a firm's total assets could change over the projection horizon. Prior to the finalization of the Stress Capital Buffer (SCB) requirement framework, the Industry Aggregate Growth Rate model forecasted industry-level growth rates of loans, non-loan assets, and total assets; the Trading Assets model projected growth rates for trading assets; and the risk weighted assets (RWA) Market model

projected growth rates for credit and market risk-weighted assets. The Board could revive this growth assumption or, alternatively, assume that a firm's assets decrease over the projection horizon.

In implementing the SCB requirement framework, the Board changed its methodology to assume that a firm takes actions to maintain, but not grow, its current level of assets over the planning horizon under stress. The primary rationale for this assumption is that it promotes consistency and comparability across firms by not attempting to predict how each firm's balance sheet would change under stressful economic conditions, in addition to reducing the complexity of the model. As some commenters noted at the time, a growing balance sheet may better reflect how firms have acted in the past under stress. Additionally, firms' internal stress test models may assume a growing balance sheet during stress. Other commenters suggested that the Board assume that market declines and losses would reduce trading assets and risk-weighted assets.

As discussed, the flat balance sheet assumption is consistent with the Policy Statement since it promotes consistency and comparability across firms, as well as simplicity within the model. Additionally, it prevents firms from assuming that they could "shrink to health" and serves the Board's goal of helping to ensure that firms remain sufficiently capitalized to accommodate credit demand in a severe downturn. For these reasons, the Board is not proposing to change the flat balance sheet assumption.

Second, the Board considered eliminating the scaling factor and relying solely on loan balances reported on FR Y-14Q, Schedule M (Balances) to serve as inputs to supervisory credit risk models. While the instructions for FR Y-14Q, Schedule M (Balances) and FR Y-9C, Schedule HC-C each describe a process for reconciling both within and across the respective reports, some rounding may still occur as described above, which can lead to discrepancies.

However, if the scaling factor is not applied, any loans that are under-reported on FR Y-14Q, Schedule M (Balances) would not receive credit losses in the supervisory stress test. Omitting these loans from incurring credit losses would go against the Board's principle of conservatism in supervisory stress testing. It would also lead to a discrepancy between the dollar value of the balances of loans used to project revenue compared to the dollar value of the balances that are used to project loan losses, which would go against the Board's principle of consistency in supervisory stress testing. Therefore, to align with the Board's principles of supervisory stress testing, as described in the Policy Statement, the Board is not proposing to eliminate the scaling factor.

<div align="center">iv.   <u>Questions</u></div>

Question A1: The Board seeks comment on eliminating the flat balance sheet assumption as compared to the current approach of maintaining flat balances. If eliminated, what approaches should the Board consider to ensure that a firm does not "shrink to health" over the projection horizon of the supervisory stress test?

Question A2: The Board seeks comment on eliminating the reconciliation between total loan balances on FR Y-14Q, Schedule M (Balances) and Schedule HC-C as compared to the Board's current approach using the reconciliation. If eliminated, how should the Board reconcile differences in total loans between these reports, if at all?

B.   Provisions Model

<div align="center">i.   <u>Statement of Purpose</u></div>

The Board calculates projected pre-tax net income in the supervisory stress test by combining projections of revenue, expenses, provisions for credit losses, and other losses. Pre-tax net income is a component of projected net income, which feeds into a firm's post-stress

capital ratios. For purposes of the supervisory stress test, the Board incorporates projected credit

losses (provisions) into projected pre-tax net income which are estimates of a firm's expected

losses on loans and leases measured at amortized cost and held-to-maturity and available-for-sale

debt securities.

The Provisions Model is an algebraic formula whose components are intended to

reasonably reflect the calculation of allowances for credit losses under a hypothetical stress

scenario. The output of the Provisions Model is intended to ensure that projected allowances for

credit losses are sufficient to capture realized and expected losses in each firm's loan, lease and

securities portfolios during each quarter of the projection horizon.

This process is critical to ensure that supervisory stress test projections are consistent,

robust, and reasonable, in accordance with the principles in the Board's Policy Statement.

ii.   Summary of Provisions Model

The Provisions Model calculates the quarterly change in a firm's credit loss allowance—

which accounts for a firm's estimate of expected credit losses on loans, leases and debt

securities—in a hypothetical stress scenario. The main components of the Provisions Model are

the allowance for expected loan, lease and securities losses in each quarter and realized losses in

each quarter. For the purposes of this section, the term "realized losses" refers to modeled

supervisory outputs which estimate loan net charge-offs and securities credit losses.

The reported allowance values as of the effective date of the stress test exercise for the

Provisions Model come from the FR Y-9C report, in which firms provide their actual year-end

allowance amounts for loans, held-to-maturity debt securities, available-for-sale debt securities,

and for credit losses on off-balance-sheet credit exposures.[2] Under the Provisions Model,

provisions for credit losses for each projected quarter in the supervisory stress test equate to the

change in the allowance needed to cover the subsequent four quarters of expected loan or

securities losses, net of realized losses in the current quarter.[3] The following equation calculates

projected provisions for each quarter t of the stress test horizon for losses on these assets:

Equation B1 – Provisions for Credit Losses

Provisions for credit losses$_t$= Allowance$_t$- Allowance$_{t-1}$+

Loan, Lease and Securities Credit Losses$_t$+Allowance Adjustment $_t$

Where:

- *Allowance* is the allowance for expected loan and securities credit losses in the current period;
- *Allowance$_{t-1}$* is the allowance for expected loan and securities credit losses in the previous period;
- *Loan, Lease and Securities Credit Losses$_t$* is the loan and securities credit losses in the current period, as defined in loan net-charge off and securities credit loss models; and
- *Allowance Adjustment* is the smoothed difference between the supervisory calculation of the allowance as of the effective date of the stress test exercise and the firm's reported allowance as of the effective date of the supervisory stress test exercise, plus the smoothed off-balance sheet allowance reported by the firm as of the effective date of the supervisory stress test exercise. The smoothing process is described below.

The Board defines the allowance in each quarter as the next four quarters of expected

credit losses under the severely adverse scenario. This definition is informed by interagency

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[2] The corresponding FR Y-9C line items for the allowance balances are as follows: allowance for credit losses on loans and leases (Schedule HC, item 4.c), on held-to-maturity debt securities (Schedule HI-B, Part II, item 7, column B), on available-for-sale debt securities (Schedule HI-B, Part II, item 7, column C), on off-balance-sheet credit exposures (Schedule HC-G, item 3).

[3] Although both use the same formula, the Board separately calculates the provisions for loan losses and the provisions for securities losses.

guidance for loss allowances under the incurred loss model.[4] The guidance states that, in

determining the appropriate allowance level, firms should use a twelve-month average net

charge-off rate as a benchmark, though it allows for a wide range of practices across the industry.

Although this guidance is not applicable to credit losses on securities, the Board also applies this

assumption when calculating the allowance for securities credit losses to align with the Stress

Test Policy Statement principles of simplicity, as well as consistency and comparability.

The Board sources expected credit losses for retail and corporate loan portfolios, for all

quarters t in the projection horizon, from supervisory credit risk models. Generally, under the

expected loss approach, supervisory stress test models estimate expected loan losses by

projecting the probability of default, loss given default, and exposure at default for each quarter

of the projection horizon (see the Credit Risk Models Documentation).

The Board also sources loan and lease losses for retail and corporate credit loan portfolios

for all quarters t in the projection horizon, from supervisory credit risk net charge-off models.

Under the net charge-off approach, losses are projected using historical behavior of net charge-

offs as a function of macroeconomic and financial market conditions and loan portfolio

characteristics (see Section G in the Credit Risk Models Documentation). For the purposes of

this section, realized losses and net charge-offs are used interchangeably.

Finally, the Board sources allowances for credit losses on available-for-sale and held-to-

maturity debt securities from the Securities Model's Credit Loss Model, which projects expected

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[4] *See* Office of the Comptroller of the Currency, et al., 2006, *Interagency Policy Statement on the Allowance for Loan and Lease Losses*. http://www.federalreserve.gov/newsevents/press/bcreg/20061213a.htm. The guidance suggests use of this benchmark for portfolios subject to FAS 5 (Statement of Financial Accounting Standards No. 5, *Accounting for Contingencies*). The guidance also indicates that other time horizons could be appropriate, depending on the effective lives of the loans in question. In addition, the guidance sets these benchmarks in the context of broader recognition that determining an appropriate level of the Allowance for Loan and Lease Losses could involve other forms of empirical analysis and considerable management judgment.

securities credit losses over a 4-quarter look-ahead period assuming constant exposure (see

Section A in the Market Risk Models Documentation).

The Board does not model allowances for off-balance sheet credit exposures; however,

the Provisions Model gives firms credit for starting allowances for credit losses on off-balance-

sheet credit exposures reported on the FR Y-9C as of the effective date of the supervisory stress

test. Consistent with the approach to the firms' reported allowances for on-balance sheet

exposures, allowances for credit losses for off-balance sheet exposures are linearly smoothed

into the Board's provisions projection over the first nine quarters of the projection horizon.

iii.   Components of the Provisions Model

The Board projects the allowance for loan and lease losses and the allowance for

securities credit losses separately, as described below. The Board also applies an adjustment to

the allowance that takes into account the allowance reported by the firm as of the effective date

of the supervisory stress test exercise, as described below. These projections use assumptions

about the look-ahead period for calculating allowances, a multiplier assumption for certain

models that use net charge-off models instead of expected loss models, and a nine-quarter

smoothing assumption for the allowance adjustment, as described in the model assumptions

section below.

a. Allowance for Loan and Lease Losses

Loan and lease losses for each quarter t of the stress test horizon are projected by the

retail and wholesale credit risk models (see the Credit Risk Models Documentation).

As described above, the Board assumes that the allowance at the end of each quarter

covers projected expected loan and lease losses for four quarters into the future. The supervisory

stress test calculation varies slightly depending on whether the supervisory loan and lease loss

models project expected loan and lease losses or net charge-offs.

For supervisory models that project expected retail and corporate credit losses, the Board

does not adjust projections before calculating the allowance.

For certain supervisory retail credit models that project net charge-offs instead of

expected loan and lease losses, the Board uses multipliers to convert net charge-offs into

expected losses before calculating the allowance. This multiplier approach is discussed in more

detail in Section B.iv.b below.

Allowance for loan and lease losses is expressed for each firm i in each quarter t as:

<div align="center">

Equation B2 – Allowance for Loan and Lease Losses

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Allowance for Loan and Lease Losses$_t$= Expected Loan and Lease Losses$_{t+1}$+
Expected Loan and Lease Losses$_{t+2}$+ Expected Loan and Lease Losses$_{t+3}$+
Expected Loan and Lease Losses$_{t+4}$

where:

- Loan Losses$_t$ represents the expected loan and lease losses, sourced directly from supervisory credit loss models. Generally, under the expected loss approach, expected loan losses are estimated by projecting the probability of default, loss given default, and exposure at default for each quarter of the projection horizon (see the Credit Risk Models Documentation).

Allowance for loan and lease losses is then fed through the provisions formula using the

following equation:

<div align="center">

Equation B3 – Provisions for Loan and Lease Losses

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Provisions for Loan and Lease Losses$_t$= ALLL$_t$- ALLL$_{t-1}$+
Loan and Lease Losses$_t$+ALLL Adjustment $_t$

- *ALLL$_t$* represents the allowance for loan and lease losses in the current period, as defined in Equation B2;

- *ALLL$_{t-1}$* represents the allowance for loan and lease losses in the previous period, as defined in Equation B2;
- *Loan and Lease Losses$_t$* represents projected realized loan and lease losses in the current period using a net charge-off approach. Under this approach, supervisory models project using historical behavior of net charge-offs as a function of macroeconomic and financial market conditions and portfolio characteristics (see the Credit Risk Models Documentation).
- *ALLL Adjustment$_t$* is the smoothed difference between the supervisory calculation of the allowance for loan and lease losses as of the effective date of the stress test exercise and the firm's reported allowance for loan and lease losses as of the effective date of the stress test exercise, inclusive of the smoothed off-balance sheet allowance reported by the firm as of the effective date of the stress test exercise, as defined in Equation B5.

Loan and lease losses are sourced from supervisory credit loan loss models and the ALLL adjustment is calculated using both the FR Y-9C reported starting value and supervisory projections of ALLL (see Section B.iii.c below).

b. *Allowance for Securities Credit Losses*

As described above, the Board assumes that firms provision for expected future securities credit losses, and that this provisioning directly impacts net income. The provisions calculation therefore sources projections of expected debt securities credit losses over the next four quarters assuming constant exposure, from the Securities Model's Credit Loss Model (see Section A.iv in the Market Risk Models Documentation).

In a similar calculation to that for loan losses above, the Board projects provisions on available-for-sale and held-to-maturity securities for a given projection quarter in the supervisory stress test to reflect both the difference in supervisory allowances from the previous quarter to the current quarter and charge-offs on available-for-sale and held-to-maturity securities losses during the current quarter.[5] The Board's projections also incorporate an adjustment based on the

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[5] Charge-offs differ from unrealized losses in that charge-offs impact a firm's net income whereas unrealized losses do not.

firm-reported allowance on available-for-sale and held-to-maturity debt securities as of the

effective date of the stress test exercise. In mathematical terms, the provisions formula for

available-for-sale (AFS) and held-to-maturity (HTM) securities is expressed for each firm *i* in

each quarter *t* as:

Equation B4 – Provisions for AFS/HTM Securities Losses

*Provisions for AFS/HTM securities losses$_t$= AFS/HTM Allowance$_t$ -
AFS/HTM Allowance$_{t-1}$+ **Charge offs on** AFS/HTM securities losses$_t$+ Allowance Adjustment $_t$*

where:

- *AFS/HTM Allowance$_t$* represents the allowance for available-for-sale and held-to-maturity debt securities credit losses in the current period, as defined in Equation A-27 in the Market Risk Models Documentation.
- *AFS/HTM Allowance$_{t-1}$* represents the allowance for available-for-sale and held-to-maturity debt securities credit losses in the previous period, as defined in Equation A-27 in the Market Risk Models Documentation.
- Charge-offs on Held-to-Maturity and Available-for-Sale Securities are estimated as the sum of credit losses from each credit sensitive debt security, applying probability and loss given default estimates to starting amortized cost security values, and are sourced directly from the Securities Model's Credit Loss Model (See Section A.iv in the Market Risk Models Documentation).
- *Allowance Adjustment$_t$* is the nine-quarter smoothed difference between the supervisory calculation of the allowance for available-for-sale and held-to-maturity debt securities as of the effective date of the stress test exercise and the firm's reported allowance for available-for-sale and held-to-maturity debt securities as of the effective date of the stress test exercise.

Charge-offs on AFS/HTM securities are sourced from the supervisory Securities Credit

Loss Model, and the allowance adjustment is calculated using both the FR Y-9C reported

starting value and supervisory allowance projections (see Section B.iii.c below).

c. *Allowance Adjustment*

As described above, the Board incorporates four quarters of projected losses into its

calculation of a firm's allowance for credit losses as of the effective date of the supervisory stress

test. This calculation is based on projected losses under the severely adverse scenario. By

contrast, a firm's reported allowance as of the effective date of the supervisory stress test is based on the firm's estimate of losses on the effective date of the supervisory stress test. Any difference between the allowance for credit loss calculations is linearly smoothed into the Board's provisions projection over the nine quarters. In other words, each quarter of the projection horizon will include one ninth of the total difference between the supervisory allowance projection and the firm's reported allowance as of the effective date of the stress test exercise, in addition to any projected losses for that quarter. A discussion of the smoothing assumption is provided in Section B.iv.c below.

The Board also gives credit for allowances for credit losses on off-balance-sheet credit exposures reported on the effective date of the supervisory stress test. The Provisions Model expresses the allowance adjustment for each firm i in each quarter t of the projection horizon with the following equation:

Equation B5 – Allowance Adjustment

$$Allowance\ Adjustment_t = \frac{Allowance_0^{SUP} - Allowance_0^{Firm}}{9}$$

- $Allowance_0^{Firm}{}_t$ represents the firm reported allowance for credit losses and off-balance sheet credit exposures on the FR-Y9C as of the effective date of the stress test exercise;
- $Allowance_0^{SUP}$ represents the supervisory calculated allowance for credit losses under the severely adverse scenario as of the effective date of the stress test exercise.

Due to data limitations, the Board does not project the off-balance-sheet credit allowance under the severely adverse scenario. Rather, the Board only considers reported values as of the effective date of the supervisory stress test. Further details are provided in Section B.iv.c.

iv.   Model Assumptions

The Provisions Model has three core underlying assumptions: the look-ahead assumption, the multiplier assumption, and the nine-quarter smoothing assumption. These assumptions are described in the following sections.

a. Look-Ahead Assumption

Per supervisory guidance[6], firms have discretion in the assumptions they use to provision for expected loan, lease and securities credit losses. However, to produce estimates across participating firms that align with the Policy Statement's principles of independence and consistency and comparability, the Provisions Model does not produce estimates using individual historic firm provisions data. Instead, the model assumes that provisioning for expected loss practices are the same across firms in the projection period.

As previously described, for a given quarter in the supervisory stress test, the Board's projected amounts for a firm's allowance for loan and lease losses equals the projected losses for the four subsequent quarters. This assumption aligns with the forward-looking nature of provisions and allowances for credit losses, as well as the forward-looking nature of the supervisory stress test. As described in Section B.ii, the rationale for this four-quarter assumption is based on supervisory guidance under the incurred loss model. For consistency, the Board also projects a firm's allowance for securities credit losses as the four subsequent quarters of securities losses. Furthermore, the Provisions Model calculates stress credit loss allowances using this four-quarter look-ahead because supervisory credit loss models extend through thirteen quarters and key scenario variable paths are available over this horizon. Any look-ahead

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[6] *See* Federal Reserve Board of Governors, 2006. *Interagency Policy Statement on the Allowance for Loan and Lease Losses*. http://www.federalreserve.gov/newsevents/press/bcreg/20061213a.htm.

longer than four quarters would require additional modeled credit losses or assumptions about credit losses past the thirteenth quarter, thereby increasing the complexity of credit loss models. On the other hand, it would be possible to calculate a shorter look ahead, but the Board determined that a shorter look ahead would be inadequate in light of the stress testing principle of conservatism and the twelve month benchmark in the Interagency Policy Statement on the Allowance for Loan and Lease Losses supervisory guidance.[7] The Board's supervisory estimate of the allowance can differ from a firm's reported allowance as of the effective date of the stress test exercise. This is because supervisory estimates of allowances are assumed to cover projected credit losses for four quarters into the future in a hypothetical stress scenario, whereas the firm's reported allowance is based on the firm's estimate of losses on the effective date of the supervisory stress test under prevailing economic conditions and outlooks.

b. *Multiplier Assumption*

The Board applies a 1.15x multiplier to retail loan portfolios for which the Board does not produce expected loss models and instead only produces net charge-off regression models, as described in the Credit Risk Models Documentation. Multipliers convert net charge-offs into expected losses for the purposes of calculating the allowance for loan and lease losses. Larger multipliers generally increase provisions expense, while smaller multipliers reduce them. The Board derived multipliers using analysis on the length of time between expected loss recognition and net charge-off recognition (loss emergence period) based on analysis using data from the 2008 financial crisis and shortly afterwards.[8] Multipliers can be calibrated by comparing four-

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[7] *Id. See also* 12 CFR 252, Appendix B (section 1.6).

[8] KPMG, LLP, 2013. *KPMG LLP Credit Risk Management Practices 2012 Survey on the Allowance for Loan and Lease Losses*. https://assets.kpmg.com/content/dam/kpmg/pdf/2013/09/survey-allowance-loan-lease-losses-2012.pdf.

quarter summed net charge-off rates to cumulative four-quarter default rates. For this

comparison, the Board used bank card loan level data from the FR Y-14M, as well as data on

credit card accounts sourced from a government agency to calculate the rate of transition to

default and net charge-off loss data from the FR Y-14Q. Results showed a range of possible

multipliers; the largest multiplier of 1.15x occurs in the earlier period of the 2008 financial crisis

(specifically, March 2008). In accordance with the principle of conservatism, and considering

the macroeconomic stress peak in the hypothetical scenario occurs in the first scenario quarter,

the Board chose the largest and earliest multiplier of 1.15x. For a more detailed discussion of the

1.15x multiplier, please see Section A.ii.e of the Proposed Model Changes for the 2026 Stress

Test document.

The Board applies this 1.15x multiplier to the following portfolios subject to modeling of

net charge-offs only: other consumer loans, business and corporate credit card loans, small

business loans, student loans, and international retail loans. The multiplier is not applied to retail

noncore net charge-off model outputs for international small business, international home equity,

international first mortgage, international other consumer, international auto, and retail non-

purpose loans. These international portfolios rely on percentiles of the historical loss distribution

rather than the contemporaneous macroeconomic environment. (For more details on these

models, please see Section G in the Credit Risk Models Documentation.) The calibration of

these models already accounts for any difference in timing between defaults and charge-offs, and

so an additional multiplier may be redundant. The retail non-purpose loan portfolio uses a loss

rate set to be equivalent to the supervisory loss rate on loans for purchasing and carrying

securities, which are modeled as wholesale rather than retail exposures. Because no multiplier is

assigned to wholesale loans, it would be inconsistent to apply a multiplier to the retail non-

purpose loans and there is no assigned multiplier on portfolios assigned constant loss rates, including retail non-purpose loans.

c. Allowance Adjustment and Nine Quarter Smoothing Assumption

The supervisory stress test's estimate of the allowance as of the effective date of the stress test exercise, which is based on projected losses under the severely adverse scenario, is usually much larger than a firm's actual allowance amount as of the effective date of the stress test exercise. A firm's reported allowance as of the effective date of the stress test exercise is based on current economic conditions and current expectations of future economic conditions, which likely do not represent the severely adverse economic scenario that is the basis for the supervisory estimate of allowances.

To bring the firm's reported allowance in line with the supervisory estimate under stress in a simple, stable and comparable manner, the Board assumes that this difference is linearly smoothed into the Board's provisions projection over the nine quarters.[9] Generally, this is equivalent to assuming that a firm gradually recognizes credit losses over the course of the stress scenario. Longer smoothing periods generally increase minimum capital ratios in the stress test, and shorter smoothing periods generally decrease them. Shorter smoothing periods may also bring the timing of a firm's minimum quarter earlier in the projection horizon.

The nine-quarter smoothing assumption affects the timing of the provisions, which in turn affects net income levels and thus capital ratios for each quarter of the horizon. The impact of the smoothing assumption on capital ratios depends on a variety of factors that differ across firms, across scenarios, and from year-to-year in different supervisory stress test cycles. These

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[9] *See* 12 CFR 252, Appendix B, parts 1.3–1.5.

factors include the size of the allowance adjustment, the size of the credit for reported qualifying allowances for credit losses on off-balance-sheet credit exposures, and the path of other components of net income over the projection horizon.

<div align="center">

v.   Alternatives to the Provisions Model

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All firms subject to the supervisory stress test have adopted the current framework for allowance calculation, known as the current expected credit loss (CECL) model. Modeling credit loss provisions using a CECL framework would thus be most reflective of firms' balance sheets, current firm practice and financial accounting standards.[10]

Projecting CECL would require significant changes to the supervisory Provisions Model. Under the CECL framework for calculating allowances for credit losses, credit loss provisions should account for losses over the entire contractual life of a loan, lease, or HTM security. Credit loss provisions for an AFS security should account for the credit portion of an unrealized loss if the amortized cost exceeds fair value at the individual security level. In contrast, the Board's current Provisions Model looks ahead four quarters into the future, rendering CECL a relatively conservative method, in many cases, to provision for credit losses.

Given the additional conservatism and complexity of lifetime credit risk provisioning requirements, the Board continues to evaluate future enhancements to the stress test approach for the incorporation of the CECL methodology. This includes extending scenario variables out for the full lifetime of loans, leases and securities in the supervisory stress test, as well as extending the allowance calculation to fully capture the expected lifetime projected losses of those loans, leases and securities.

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[10] Financial Accounting Standards Board (FASB), 2016. Financial Instruments–Credit Losses (Topic 326). *FASB Accounting Standards Update*, 2016-13.

There would also be implications for adjusting the smoothing assumption that is inherent in the Board's nine-quarter smoothing approach for allowance adjustments and credits. The CECL methodology, by design, requires firms to consider forward-looking information for estimating allowance for credit losses, which may conceptually warrant a shorter look-ahead period for incorporating the difference between the supervisory calculation of allowances as of the effective date of the stress test exercise and the firm's reported allowance as of this same date. This look-ahead assumption could range from a one-quarter look-ahead—which assumes that firms have perfect foresight into their expected losses—to a look-ahead lasting a number of quarters that would assume firms take time to adapt expectations to meet the stressful conditions of the severely adverse scenario.

<u>vi.</u>   <u>Questions</u>

The Board seeks comment on:

Question B1: What alternatives should the Board consider for its three assumptions related to the Provisions Model? What would be the advantages and disadvantages of these alternatives?

Question B2: The Board is not proposing to incorporate CECL into its supervisory projections at this time. However, if the Board did incorporate the CECL model into its projection of provisions, what assumptions should the Board consider to improve precision and reasonableness? What would be the advantages and disadvantages of these assumptions?

Question B3: What are the advantages and disadvantages of using the Provisions Model, as described? Are there any other alternatives, aside from the CECL model, that the Board should consider? If so, what are their advantages and disadvantages?

Question B4: Are there additional data sources the Board should consider incorporating into the Provisions Model? If so, which ones? What would be the advantages and disadvantages of incorporating these data sources?

Question B5: Are there changes to the Board's modeling approach for the Provision Model that could better align it with the Stress Test Policy Statement principles?

C.   Retained Earnings Model

i.   Statement of Purpose

Retained earnings are a component of regulatory capital as defined by the Board's Regulation Q.[11] Retained earnings represent the undistributed profits which a firm could use to absorb losses and serve as a key component of projected common equity tier 1 capital in the stress test. Projected common equity tier 1 capital in turn feeds into the projections of a firm's post-stress capital ratios for purposes of the supervisory stress test.

The Board calculates retained earnings in the supervisory stress test by combining projections of pre-tax net income, taxes, and capital distributions. The model the Board uses to calculate retained earnings (the Retained Earnings Model) is an algebraic formula whose components are intended to reflect a firm's financial position, given supervisory projections of revenues, expenses, losses, and provisions, in a hypothetical stress scenario.

ii.   Summary of Retained Earnings Model

The Retained Earnings Model reflects the main items a firm would use to calculate retained earnings in a hypothetical stress scenario given the relevant and current accounting, tax,

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[11] *See* 12 CFR 217.20(b)(2).

and regulatory reporting instructions. Starting values for the Retained Earnings Model items as

of the effective date of the stress test are sourced from the FR Y-9C or the FR Y-14Q.

The Retained Earnings Model includes several items which measure firm profitability

and financial position before taxes. Specifically, retained earnings projections include revenues,

expenses, gains, and losses excluding other comprehensive income.

The Model takes starting values for retained earnings as of the effective date of the stress

test exercise from the FR Y-9C, Schedule HC-R, Part I item 2 (Retained earnings). In the first

quarter of the projection horizon and onwards, the Model then adjusts this value with supervisory

projected after-tax net income minus any planned cash dividends declared on preferred stock and

projected net income (loss) attributable to minority interests. The Model does not include

common dividends, which are assumed to be zero in this calculation (four quarters of common

dividends are included in the calculation of each firm's stress capital buffer separately). The

Model calculates retained earnings in the stress scenario using the following equation for each

firm *i* in each quarter *t* over the projection horizon:[12]

Equation C1 - Retained Earnings

Retained Earnings(t,i) = Retained Earnings(t-1,i)+ Pre-Tax Net Income(Loss) (t,i)

-Tax Expense(Benefit) (t,i) - Preferred Dividends(t,i) -Net Income(Loss) Attributable to Minority Interests(t,i)

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[12] Note that for all formulas in this section, any model variable name in parentheses indicates a negative sign and value for the item. Positive or negative signs in front of a variable name indicate the proper mathematical operation and are not meant to indicate variable signage.

iii. Components of the Retained Earnings Model

a. *Pre-Tax Net Income (Loss)*

The components of supervisory stress pre-tax net income are:

- projections of pre-provision net revenue, where net revenue includes interest income, non-interest income, interest expenses, non-interest expenses and operational risk expenses (see the Pre-Provision Net Revenue Models Documentation and the Operational Risk Models Documentation for more details);
- projections of provisions (see Section B);
- projections of trading and counterparty losses (see Sections E, F, G, and H in the Market Risk Models Documentation and);
- projections of other losses, where "other losses" include losses on loans held for sale and measured under the fair value option (see Section B in the Market Risk Models Documentation), accrual loan hedges (see Section B in the Market Risk Models Documentation), equity losses (gains) (see Section A in the Market Risk Models Documentation), and private equity fair value losses (gains) (see Section D in the Market Risk Models Documentation).

The Retained Earnings Model takes quarterly values of these items for each firm i in each quarter t over the projection horizon to calculate stress Pre-Tax Net Income, expressed formulaically below:

Equation C2 - Pre-Tax Net Income

Pre-tax Net Income(Loss) (t,i)=Pre-Provision Net Revenue (Loss) (t,i)–Provisions(t,i)–Trading and Counterparty Losses(Gains) (t,i) –Other Losses (Gains)(t,i)

Although all firms can experience gains and losses from trading and counterparty activities, in the stress test only certain covered firms are subject to the global market shock scenario or the largest counterparty default component scenario. The decomposition of trading and counterparty losses (gains) from other losses in the projection of pre-tax net income enables the Board to disclose these results separately for impacted firms, thus facilitating better results analysis and transparency.

b. *Tax Expense (Benefit)*

Next, the Board subtracts the impact of tax expense from (or adds the impact of a tax

benefit to) pre-tax net income. The components of tax expense projections under stress include,

quarterly:

- taxes owed (see taxes owed subsection below);
- changes in deferred tax assets that arise from net operating loss and tax credit carryforwards, net of any related valuation allowances and net of deferred tax liabilities[13] (referred to as "DTAs from NOL", see Section C.iii.d);
- change in deferred tax assets arising from temporary differences, net of deferred tax liabilities (referred to as "DTAs from Timing", see Section C.iii.e below); and
- change in valuation allowance (see Section C.iii.f below). The Retained Earnings Model does not project tax receivables.

The Retained Earnings Model's tax expense equation incorporates tax items in a simple,

consistent manner for firms in the stress test, expressed by the formula below[14] for each firm i in

each quarter t over the projection horizon:

Equation C3 – Tax Expense

Tax Expense(Benefit)(t,i)=Taxes Owed(t,i)–change in DTAs from NOL(t,i)–change in DTAs from Timing[15](t,i) + change in Valuation Allowance(t,i)

Taxes Owed represents taxes the firm would owe by the end of each quarter and is

floored at zero. And for each firm i in each quarter t over the projection horizon;

Equation C4 – Taxes Owed

Taxes Owed(t,i) = 0 if Taxable Income (Loss) (t,i) < 0

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[13] *See* FR Y-9C Schedule HC-R, Part I, Line 8.

[14] As an alternative, this can be expressed simply as tax expense = 21% * pre-tax net income + change in valuation allowance. However, equation (5) provides a detailed breakout of the items that the Retained Earnings model uses to calculate tax expense.

[15] Reflecting FR Y-9C reporting instructions which exclude other comprehensive income from retained earnings, the Board removes other comprehensive income-related DTAs from Timing from the tax expense formula via simple subtraction.

and Taxes Owed(t,i) = (Tax Rate * Taxable Income(Loss) (t,i)) – Min(DTAs from NOL(t,i –1) , 80% * Tax Rate * Taxable Income(Loss) (t,i)),   if Taxes Owed(t,i) > 0

The Retained Earnings Model calculates Taxable Income as:

Equation C5 – Taxable Income

Taxable Income(Loss) (t,i) = Pre-Provision Net Revenue(t,i) – Net Charge Offs on Loans and Leases(t,i) – Charge Offs on Held-to-Maturity and Available-for-Sale Securities - Trading and Counterparty Losses(Gains)(t,i) – Fair Value Loan Losses(Gains) (t,i) + Accrual Loan Hedge Gains(Losses) (t,i)

Where:

- Pre-Provision Net Revenue, Trading and Counterparty Losses (Gains), Fair Value Loan Losses (Gains) and Accrual Loan Hedge Gains (Losses) are defined in Section C in the Aggregation Models Documentation (Retained Earnings).
- Net charge-offs on loans and leases are sourced from Credit Risk Models (see the Credit Risk Models Documentation), which project losses using historical behavior of net charge-offs as a function of macroeconomic and financial market conditions and loan portfolio characteristics.
- Charge-offs on Held-to-Maturity and Available-for-Sale Securities, estimated as the sum of credit losses from each credit sensitive debt security, applying probability and loss given default estimates to starting amortized cost security values, are sourced directly from the Securities Model's Credit Loss Model (See Section A.iv in the Market Risk Models Documentation).

c. *Taxes Owed*

The Retained Earnings Model defines taxes owed as the statutory federal corporate tax rate applied to taxable income, where taxable income equals pre-provision net revenue after net charge offs on loans and leases (see Section B), charge-offs on held-to-maturity and available-for-sale securities, trading and counterparty losses (gains), fair value loan losses (gains), and accrual loan hedge gains (losses), as shown in Equation C5 above. Negative values for taxable income indicate that a firm is not profitable under stress and as a result does not owe taxes that quarter. The Model also designates negative taxable income as estimated total net operating

losses for the quarter, which are used to estimate tax benefits generated in the form of deferred tax assets. Consistent with the Stress Test Policy principles of simplicity and conservatism, the Board does not model tax receivables in its tax expense estimates under a hypothetical stress scenario.

Conversely, positive taxes owed indicate that a firm is profitable under the hypothetical stress scenario and thus the Retained Earnings model assumes these positive values represent a firm's gross tax liability for the quarter. The model then reduces positive taxes owed by the maximum possible DTA from NOL carryforward usage, which is set to the lesser of 80 percent of taxable income or the prior period's stock of DTAs from NOL (described in Section C.iii.d). This seeks consistency with the statutory provisions of the Tax Cuts and Jobs Act, which limits firms' ability to reduce taxes through net operating loss carryforwards to 80 percent of taxes owed.[16]

d. DTAs from NOL

As part of covered firms' tax expenses and benefits, the Board seeks to simulate deferred tax assets from net operating losses. When supervisory projections under stress produce a net operating loss, the Retained Earnings Model generates a deferred tax asset to reflect net operating losses, which in turn increases a firm's tax benefits under stress. Conversely, if a firm is projected to have positive taxable income and therefore a higher tax expense in the hypothetical stress scenario, the Retained Earnings Model recognizes that firm would use their DTAs from NOL to offset this tax expense, thus reducing the balance of DTAs from NOL.

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[16] Tax Cuts and Jobs Act of 2017, Public Law 115-97, 131 Stat. 2054 (2017); 26 U.S.C. 172(a).

To calculate DTAs from NOL in each quarter *t* of the projection horizon, the Board starts with values reported by firms in reporting form FR Y-14Q, Schedule D (Regulatory Capital). Then, net operating losses for each quarter *t* of the projection horizon are calculated using the results of the stress test calculation of taxable income.

Equation C6 – DTAs from NOL

DTAs from NOL(t,i) = DTAs from NOL(t—1,i) + Tax Rate * Taxable Income(Loss) (t,i) , if Taxable Income(Loss) (t,i) < 0

DTAs from NOL(t,i) = DTAs from NOL(t—1,i) – Minimum(DTAs from NOL(t,i—1), (80 percent * Tax Rate * Taxable Income(Loss) (t,i)), if Taxable Income(Loss) (t,i) > 0

e. *DTAs from Timing*

As part of covered firms' tax expenses and benefits, the Board seeks to simulate deferred tax assets from temporary differences. The Retained Earnings Model generates a deferred tax asset under stress when a firm records a gain or loss for financial reporting purposes earlier or later than when it records these same gains or losses for tax purposes (DTAs from Temporary Differences, referred to as "DTAs from Timing" here). In accordance, the Retained Earnings Model calculates DTAs from Timing as the difference between when income or losses are booked for financial reporting purposes and for tax purposes. Growth of these assets in turn increases a firm's tax benefits under stress.

The Board designates projected credit provisions from the stress test Provisions Model, as well as fair value private equity gains (losses) and equity gains (losses), as income or losses booked for financial reporting purposes. For each quarter of the projection horizon, the Board calculates the difference between income or losses booked for financial reporting purposes and those booked for tax purposes (as defined above in Equation C5).

In addition, the Board incorporates the tax impact of any other relevant unrealized gain and loss items that could generate temporary differences and that are available from other supervisory stress projection models; specifically, unrealized available-for-sale securities gains (losses),[17] private equity fair value gains (losses), and equity gains (losses). The Board multiplies these projected unrealized values by the statutory federal corporate tax rate to calculate DTAs from Timing for each firm i in each quarter t over the projection horizon.

Equation C7 – DTAs from Timing

DTAs from Timing(t,i)= DTAs from Timing(t-1,i) + Tax Rate * ([Provisions for Loan and Debt Securities Credit Losses(t,i) – Net Charge offs on Loans and Leases(t,i) – Charge offs on Held-to-Maturity and Available-for-Sale Securities(t,i)] – Unrealized Available-for-Sale Securities Gains(Losses)(t,i)[18]– Equity Gains(Losses)(t,i) – Private Equity Fair Value Gains(Losses)(t,i)[19])

where

- Starting values for DTAs from Timing as of the effective date of the stress test exercise are sourced from the FR Y-14Q, Schedule D (Regulatory Capital) form.
- Provisions for credit losses are sourced from the Provisions Model (see Section B).
- Net charge-offs on loans and leases are sourced from Credit Risk Models (see the Credit Risk Models Documentation), which project losses using historical behavior of net charge-offs as a function of macroeconomic and financial market conditions and loan portfolio characteristics.
- Charge-offs on Held-to-Maturity and Available-for-Sale Securities, estimated as the sum of credit losses from each credit sensitive debt security, applying probability and loss given default estimates to starting amortized cost security values, are sourced directly from the Securities Model's Credit Loss Model (see Section A.iv in the Market Risk Models Documentation).
- Unrealized Available-for-Sale Securities Gains (Losses), calculated as the difference between each debt security's fair value and its amortized cost, are sourced directly from the Securities Model's AFS Debt Securities Model (see Section A in the Market Risk Models Documentation).

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[17] Applicable only to firms that include accumulated other comprehensive income in capital.

[18] Applicable only to firms that include accumulated other comprehensive income in capital.

[19] Applicable only to firms subject to the Global Market Shock.

- Equity Gains (Losses), calculated as the sum of security position-level fair value changes, are sourced directly from the Securities Model (see Section A in the Market Risk Models Documentation).
- Changes to private equity fair value, which are projected as changes in the fair value of private equity assets over the stress test horizon regardless of the individual accounting elections made in determining their carry values, and recognized as unrealized gains (losses), are sourced directly from the Private Equity Model (see Section D in the Market Risk Models Documentation).

In addition to the items listed above, DTAs from Timing can arise from many different sources, such as deferred compensation and other employee benefits; investment tax credits; asset depreciation; capital leasehold improvements; and mark-to-market adjustments for certain financial instruments. The Board assumes that the contribution of these items to DTAs from Timing remains constant as of the effective date of the stress test exercise. Producing dynamic estimates for these values in each quarter t of the projection horizon would require an increase to the Board's information collection requirements and would necessitate additional models. Moreover, the impact of different DTA types depends on various factors, such as size, pre-tax net income stress path, and amortization and depreciation schedules.

The Tax Cuts and Jobs Act generally eliminated corporate tax carrybacks.[20] As such, the Retained Earnings Model does not calculate tax carrybacks.

f. Valuation Allowance

Firms generally record a valuation allowance as a contra-asset account[21] against their deferred tax assets if, based on the weight of evidence available, it is more likely than not that some portion or all of a deferred tax asset will not be realized. The Valuation Allowance equation in the Retained Earnings Model thus evaluates whether a firm will have sufficient

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[20] Tax Cuts and Jobs Act of 2017, Public Law 115-97, 131 Stat. 2054 (2017).

[21] Contra asset accounts have a credit balance which is the opposite of normal debit balance for asset accounts. Contra asset accounts are used to reduce the value of another asset account.

taxable income to realize its deferred tax assets from temporary differences (see Section C.iii.e).

The Board deems deferred tax assets to be unusable in a stress scenario when a firm is not

profitable and does not generate a positive tax bill that a deferred tax asset could be used to

offset. To calculate the valuation allowance, the Board assumes that when DTAs from Timing

exceed the future four-quarter sum of Taxes Owed, firms would be unlikely to use the deferred

tax assets and would instead allocate them to their valuation allowance. The Board therefore

estimates the valuation allowance as the gap between a firm's stock of DTAs from Timing and

the next four quarters of future taxes owed. A discussion of valuation allowance assumptions is

provided in Section C.iv.a below.

The Board sources the starting values for valuation allowance from Schedule D. The

amount of the valuation allowance is floored at zero so that it cannot be negative.

g. *Net Income Attributable to Minority Interests*

The Retained Earnings Model adjusts after-tax net income (loss) by net income (loss)

attributable to non-controlling (minority) interests and sources starting values from the FR Y-9C

as of the effective date of the stress test exercise.[22] As the stress test is performed at the holding

company level, the Board does not develop stress test models that project income on a legal-

entity basis. As a result, the Retained Earnings Model estimates the quarterly stress value of

income attributable to minority interests by multiplying 60 percent (i.e., a 40 percent haircut) to

the firm-reported, trailing historic four-quarter average value of income attributable to minority

interests. This approach is consistent with the Board's principles of simplicity, conservatism and

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[22] FR Y-9C Schedule HI, Item 13.

independence, as defined in the Board's Stress Test Policy Statement.[23] A detailed discussion of this assumption is in Section C.iv.c below.

h. *Preferred Dividends*

The capital rule dictates certain assumptions regarding capital actions in the supervisory stress test projection horizon. Specifically, firms must make payments on instruments that qualify as additional tier 1 capital or tier 2 capital equal to the stated dividend, interest, or principal due on such instruments. The Retained Earnings Model thus assumes that firms continue to pay their preferred dividends throughout the projection horizon.[24] As such, planned cash dividends on preferred stock declared by firms on the FR Y-14A, Schedule C (Regulatory Capital Instruments) flow through the Retained Earnings Model (see Equation C1). This assumption that firms continue to pay preferred dividends under a hypothetical stress scenario also reflects the fact that preferred stock agreements often require dividends to be paid first after liabilities are settled but before distributions can be made to other shareholders.

iv.   Model Assumptions

a. *Valuation Allowance Four-Quarter Lookahead*

The Retained Earnings Model valuation allowance evaluates the amount of DTAs from Timing that could likely be used to offset taxes owed under a hypothetical stress scenario. For this purpose, the Board assumes a four-quarter look-ahead[25] for the valuation allowance, to align with the Provisions Model assumption that the difference in timing between loss recognition for provisioning purposes and for net charge-off purposes is four quarters (see Section B). Aligning

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[23] *See* 12 CFR 252, Appendix B.

[24] *See* 12 CFR 252.56(b)(2).

[25] In other words, the next four quarters constitute a four-quarter look-ahead.

the Retained Earnings Model's assumption of taxable income for the valuation allowance with

this reversal assumption also ensures a straightforward calculation based on the published 13-

quarter horizon of the supervisory severely adverse scenario. Finally, the four-quarter look-

ahead assumption aligns well with the Board's stress test principles because it represents a

conservative and forward-looking measure of the usability of deferred tax assets.[26]

Replacing the four-quarter look-ahead assumption with alternative, longer look-ahead

periods or look-back periods would not align with the Stress Test Policy Statement's principle of

conservatism. Additionally, a longer look-ahead period may overstate a firm's ability to realize

deferred tax asset benefits under stress, especially given that firms may fall below the minimum

capital requirement threshold in the projection horizon. A firm that approaches or breaches

minimum capital requirements in a severely adverse stress scenario would have a weak

profitability outlook and thus insufficient probable taxable income for these deferred tax assets to

likely be realized. And, as a result, these deferred tax assets are unlikely to be able to absorb

capital losses.

The Board recognizes that a wide range of alternative look-ahead and look-behind

specifications are possible, ranging from a shorter, one-quarter look-ahead to several years ahead

and several years or quarters prior. Look-behind assumptions are generally less desirable than

look-ahead assumptions because they enhance—rather than limit—reliance on past outcomes.[27]

Look-ahead specifications that extend beyond the next four quarters require that the Board make

assumptions regarding taxable income for the valuation allowance, because supervisory

projections of net revenue, gains and losses do not extend past 13 quarters (and, in some cases,

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[26] *See* 12 CFR 252, Appendix B.

[27] *Id*.

do not extend past nine). The Board has thus tested alternative specifications for a look-ahead horizon slightly longer and shorter than four quarters, ranging from 2 to 8 quarters ahead. These tests kept all else equal and only varied the quarters over which the taxable income for the valuation allowance was calculated, making taxable income larger and smaller. The Board then looked at the impact to minimum capital ratios and found that a longer look-ahead increases taxable income generation potential, which reduced the valuation allowance and increased projections of common equity tier 1 capital under stress. In contrast, a shorter look-ahead had the opposite effect.

Another alternative to the four-quarter look-ahead would assume an unchanged valuation allowance from the value as of the effective date of the stress test exercise. Such an approach would be contrary to the principle of conservatism, as taxable income for the valuation allowance values would be based solely on past performance and as a result would generally exclude the effects of economic stress. Any benefits from Deferred Tax Asset (DTA) usage under this assumption would thus represent an upper bound to capital adequacy in the stress test, presenting the most optimistic outlook possible for DTA usage despite deteriorating economic conditions in the hypothetical stress scenario.

The four-quarter look-ahead also requires the Board to make assumptions regarding certain supervisory stress test inputs for taxable income when unavailable for projection quarters 10–13. Specifically, supervisory stress test projections of fair value loan losses do not extend past the ninth projection quarter. The Board thus assumes that firms do not make fair value loan losses or gains for the last four quarters of the hypothetical stress scenario. The materiality of this assumption is low; the Board analyzed various alternatives given available data and projections. Alternatives include setting these equal to the ninth-quarter value for fair value loss

(gain) under the supervisory adverse scenario; however, doing so generally represents a less conservative approach, as the relevant macroeconomic scenario variables generally follow a recovery trajectory, which supports gains. At the same time, using supervisory baseline values in a similar manner represents a more conservative approach, as macroeconomic variable paths are generally flatter and can slightly decline, making losses more likely. Setting the out-quarter values[28] to zero is thus a reasonably independent, simple, and conservative approach in comparison with the two alternative options explored. The difference in results between the current approach and these alternatives is also generally immaterial.

In the 2024 stress test, the impact of this assumption compared with the alternatives described above was modest across firms, with most firms seeing no impact to capital ratios and individual impacted firms seeing less than a 5 basis point difference in their minimum stress capital ratio.

b. Unitary Tax Rate Assumption

All applications of tax rates in the tax expense formula assume a uniform statutory corporate tax rate of 21 percent under a single U.S. federal tax jurisdiction. Setting all firms' tax rate to 21 percent implicitly assumes no tax exclusions, deductions, or additional state and local taxes, and assumes that the effective rate is similar to the legally-defined corporate tax rate of 21 percent.[29] Assuming that all income and deferred tax assets are subject to the same federal U.S. statutory tax rate simplifies the Retained Earnings Model and facilitates comparability across

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[28] The out quarters are the 10th, 11th, 12th, and 13th quarters in the hypothetical stress scenario.

[29] Tax Cuts and Jobs Act of 2017, Public Law 115-97, 131 Stat. 2054 (2017); 26 U.S.C. 11(a)–(b).

firms. As such, this assumption is simple and consistent, reflecting the Board's stress testing principles.[30]

An alternative assumption could rely on firm-reported inputs representing the relationship between income and taxes at individual firms. This assumption would reflect the fact that firms have meaningful discretion over their own stress modeling, accounting and tax practices; and that firms have more idiosyncratic, detailed information regarding the tax regimes that apply to their activities. However, using firm-reported inputs and assumptions does not align with the Board's principle of model independence or comparability. Additionally, a supervisory review of firm stress test results conducted by the Federal Reserve in 2019 revealed significant variation in the data, methods, and assumptions that firms apply when calculating their projections of taxes under stress. An approach of relying on firm estimates would require both additional data reporting and significantly more complex methodologies. A single tax-rate jurisdiction assumption limits the amount of data the Board needs to collect and validate on state, local, and foreign tax projections and on potential credits, exclusions, and deductions.

The Board has analyzed this assumption by calculating firms' minimum stress capital ratios under alternative uniform supervisory tax rates each year, ranging from 0 to 100 percent. Results show that firms with positive cumulative pre-tax net income tend to experience less severe capital declines with a lower tax rate. At the same time, cumulatively unprofitable firms post higher capital ratios with a higher tax rate. Specifically, using 2024 stress test results, the aggregate capital decline is nine basis points more severe under an assumed 15 percent tax rate and five basis points less severe under a 25 percent tax rate. As a result, the stress projections of

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[30] *See* 12 CFR 252, Appendix B.

after-tax net income are more conservative with lower tax rates, all else equal. Our analysis also

demonstrates that firms with stronger pre-provision net revenue and with larger deferred tax

asset levels are more sensitive to tax rate assumptions.

    c. Net Income Attributable to Minority Interests 40 Percent Haircut

       The Retained Earnings Model applies a 40 percent haircut to recent historic performance

of net income attributable to minority interests to align with the Board's stress test principles of

conservatism and simplicity.[31] The Board thus represents net income attributable to minority

interests for each firm *i* in each quarter *t* over the projection horizon as:

Equation C8 – Net Income Attributable to Minority Interests

Net Income(Loss) Attributable to Minority Interests(t,i) = [Net Income(Loss) Attributable to Minority Interests (t,i at time 0) + Net Income(Loss) Attributable to Minority Interests (t,i – 1) + Net Income(Loss) Attributable to Minority Interests (t,i – 2) + Net Income(Loss) Attributable to Minority Interests (t,i – 3))] / 4 * 60%

       The 60 percent ratio—which, otherwise stated, represents a 40 percent haircut—was

adopted in 2019 for the 2020 Stress Test. It was calibrated at that time based on the most

recent[32] four-year average of the relationship between actual net income attributable to minority

interests and firm-projected stress net income attributable to minority interests. In aggregate, the

data showed a stable relationship, where projected net income attributable to minority interests

ranged between 55 and 70 percent of actual net income attributable to minority interests in any

given year before each stress test exercise. The Board thus chose the cross-firm, average haircut

over the four-year period of 40 percent and applies this to actual net income attributable to

minority interests in the year before each stress test exercise. Although individual firm

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[31] *See* 12 CFR 252, Appendix B.

[32] Specifically, 2015–2018.

projections of net income attributable to minority interests showed significant variation in pre- and post-stress figures for individual firms, regular annual monitoring analysis of results shows that for most firms this item is immaterial.

As an alternative, the Board considered using firm-specific projections of this item in the stress test, because firms that report the FR Y-14A provide stress projections for net income attributable to minority interests. An analysis of this item in the 2024 firm-run stress tests demonstrated that firm-provided values produce approximately the same capital results as setting net income attributable to minority interests to zero over the projection horizon; only in a handful of cases do firm projections indicate a slight (less than 10 basis points) difference in either direction.[33]

Given the relative immateriality of net income attributable to minority interests for retained earnings projections and the information collecting burden that would be required to project losses for minority interests, the Board has chosen this approach to minimize complexity and align with the Board's stress test principle of simplicity.

<div align="center">v.   Alternatives to Retained Earnings Model</div>

The Retained Earnings Model is based on accounting concepts, definitions and the FR Y-9C reporting instructions, and so the Board has not explored alternative models other than those described in this section.

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[33] Analysis based on 2024 Stress Test results and FR Y-14A reporting.

vi.   Questions

The Board seeks comment on:

Question C1: Is there any other alternative formula or model that the Board should consider to estimate retained earnings? What would be the advantages and disadvantages of using that alternative to estimate retained earnings?

Question C2: Are there any data sources or data adjustment steps the Board should consider when modeling retained earnings? If so, what are they? What would be the advantages and disadvantages of those steps?

Question C3: Are there any changes or additions to the items included in the Retained Earnings Model tax expense calculation that the Board should consider? If the Board were to make a change or addition, how should the Board address information collection burdens, avoid the creation of a more complex methodology, and potential inaccuracies? What would be the advantages and disadvantages of that change?

Question C4: Should the Board consider modifying the valuation allowance four-quarter look-assumption? If the Board were to change the valuation allowance look-ahead assumption, how should the Board address information collection burdens, avoid the creation of a more complex methodology, and potential inaccuracies? What would be the advantages and disadvantages of that change?

Question C5: Should the Board consider modeling deferred tax assets from timing differences from other sources besides those already included in the Capital Model? If the Board were to model other types of deferred tax assets from timing differences, how should the Board address information collection requirements and burdens? How could the Board best

avoid the creation of a more complex methodology? What would be the advantages and disadvantages of that change?

Question C6: What are the advantages and disadvantages of using the unitary tax rate assumption to model retained earnings in the supervisory stress test? Should the Board consider modifying or eliminating the unitary tax rate assumption? If the Board were to change the unitary tax rate assumption, how should the Board address information collection burdens and avoid the creation of an unduly complex or inconsistent methodology? What would be the advantages and disadvantages of that change?

Question C7: What are the advantages and disadvantages in using a haircut on net income attributable to minority interests based on historic averages, to model net income attributable to minority interests in the supervisory stress test? Should the Board consider modifying or eliminating the haircut on net income attributable to minority interests? If the Board were to modify the haircut on net income attributable to minority interests, how should the Board approach data collection? What would be the advantages and disadvantages of that change?

Question C8: Are there aspects of applicable tax laws that could impact how the Board calculates retained earnings, especially in relation to tax expenses, deferred tax assets, or other tax items, which are not currently being taken into account, and which should be incorporated into the calculation? If so, what are the relevant aspects, and how should the Board consider incorporating them in its retained earnings calculations? What would be the advantages and disadvantages of such changes?

D.   Capital Model

i.   Statement of Purpose

The Board includes five regulatory capital measures in the supervisory stress test: (1) common equity tier 1 risk-based capital ratio;[34] (2) tier 1 risk-based capital ratio;[35] (3) total risk-based capital ratio;[36] (4) tier 1 leverage ratio;[37] and (5) supplementary leverage ratio.[38] A firm's regulatory capital ratios are calculated in accordance with the Board's regulatory capital rule using Federal Reserve projections of pre-tax net income and other scenario-dependent regulatory capital components.

As per the capital rule, the projected common equity tier 1 risk-based capital ratio is used to determine a firm's stress capital buffer requirement,[39] which aims to evaluate whether covered firms have the capital necessary to absorb losses as a result of adverse economic conditions.[40] Accordingly, this section focuses on the Board's calculation of a firm's projected common equity tier 1 capital ratio for purposes of the stress capital buffer requirement (the Capital Model).

ii.   Model Description

The Board calculates the change in regulatory capital over the projection horizon by combining projected after-tax net income with projected changes in other comprehensive income, and adjustments and deductions to common equity tier 1 capital. The Board calculates

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[34] *See* 12 CFR 217.10(b)(1); *see also* 78 FR 62018.

[35] *See* 12 CFR 217.10(b)(2); *see also* 78 FR 62018.

[36] *See* 12 CFR 217.10(b)(3); *see also* 78 FR 62018.

[37] *See* 12 CFR 217.10(b)(4); *see also* 78 FR 62018.

[38] *See* 12 CFR 217.10(c)(1); *see also* 78 FR 62018.

[39] *See* 12 CFR 217.11(a)(2)(vi) and 12 CFR 225.8(f).

[40] *See* 12 CFR Part 252.41(b); 90 FR 16843.

the path of regulatory capital over the projection horizon by combining the projected change in

common equity tier 1 capital with the firm's starting capital position and accounting for other

adjustments to regulatory capital specified in the Board's regulatory capital framework. The

Board calculates the denominator of the common equity tier 1 ratio using standardized total risk-

weighted assets, as defined in the capital rule,[41] for each quarter of the projection horizon.

The Capital Model projection of common equity tier 1 capital uses a set of formulas

consistent with stress test rule,[42] the capital rule,[43] and the FR Y-9C reporting instructions, where

indicated. The Board has designed the Capital Model to follow these rules and reporting

standards as closely as possible. As a result, the common equity tier 1 formulas within the

Capital Model mimic the FR Y-9C, Schedule HC-R (Regulatory Capital) structure and contents.

The Board's general approach is to (1) source starting values of regulatory capital items from the

FR Y-9C and FR Y-14Q; (2) use supervisory stress test projections and methodologies, wherever

available, for quarters throughout the projection horizon; and (3) incorporate firm-planned

capital actions throughout the projection horizon as required by the stress test rule.[44]

The Capital Model contains three main components, which reflect the FR Y-9C,

Schedule HC-R (Regulatory Capital) calculation of regulatory capital: (1) common equity before

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[41] The capital rule defines standardized total risk-weighted assets as (1) the sum of (i) total risk-weighted assets for general credit risk as calculated under 12 CFR 217.31; (ii) total risk-weighted assets for cleared transactions and default fund contributions as calculated under 12 CFR 217.35; (iii) total risk-weighted assets for unsettled transactions as calculated under 12 CFR 217.38; (iv) total risk-weighted assets for securitization exposures as calculated under 12 CFR 217.42; (v) total risk-weighted assets for equity exposures as calculated under 12 CFR 217.52 and 217.53; and (vi) for a market risk Board-regulated institution only, standardized market risk-weighted assets; minus (2) any amount of the Board-regulated institution's allowance for loan and lease losses or adjusted allowance for credit losses, as applicable, that is not included in tier 2 capital and any amount of "allocated transfer risk reserves." *See* 12 CFR 217.2, Standardized total risk-weighted assets; *see also* 78 FR 62018.

[42] *See* 12 CFR 252.

[43] *See* 12 CFR 217.

[44] *See* 12 CFR 252.44(c); *see also* 86 FR 7927.

regulatory adjustments and deductions; (2) common equity regulatory adjustments and deductions; and (3) risk-weighted assets.[45] The first two items adjust a firm's common equity capital as defined under U.S. GAAP to arrive at a projection of common equity tier 1 capital under the capital rule. This amount is then divided by supervisory projections of each firm's risk-weighted assets under the standardized approach to produce each firm's forecasted common equity tier 1 capital ratio. The Board calculates the common equity tier 1 capital ratio for each firm i in each quarter t over the projection horizon:

Equation D1 – Common Equity Tier 1 Capital Ratio

Common equity tier 1 capital ratio(t,i) = [common equity tier 1 capital before adjustments and deductions(t,i) – common equity tier 1 capital adjustments and deductions(t,i)] / Standardized risk-weighted assets(t,i)

The sections below provide additional detail and descriptions of each of these components and their subcomponents.

iii.   Model Components

Consistent with the capital rule[46] and FR Y-9C Schedule HC-R, Part I (Regulatory Capital Components and Ratios), the Board decomposes common equity tier 1 capital into three main subcomponents: Common Equity Tier 1 Capital Before Adjustments and Deductions, Common Equity Tier 1 Capital Adjustments and Deductions, and Threshold Adjustments and Deductions to Common Equity Tier 1 Capital.

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[45] As per the FR Y-9C instructions, this schedule should be read in conjunction with the capital rule. *See* 12 CFR Part 217; 78 FR 62018.

[46] *See* 12 CFR Part 217.20.

   a. Common Equity Tier 1 Capital Before Adjustments and Deductions

The Board first projects common equity tier 1 capital before adjustments and deductions

for each firm *i*, in each quarter *t* of the projection horizon. Consistent with the capital rule and

the FR Y-9C Schedule HC-R, Part I, Line 5 (Common equity tier 1 capital before adjustments

and deductions),[47] the Capital Model calculates common equity tier 1 capital before adjustments

and deductions as the sum of common stock plus related surplus,[48] retained earnings,[49]

accumulated other comprehensive income (for applicable firms),[50] and minority interest

includable in common equity tier 1 capital.[51] The Capital Model formula for common equity tier

1 capital before adjustments and deductions is thus expressed for each firm *i* in quarter *t* as:

   Equation D2 – Common Equity Tier 1 Capital Before Adjustments and Deductions

   Common equity tier 1 capital before adjustments and deductions(t,i) = common stock

   plus related surplus(t,i) + retained earnings(t,i) + accumulated other comprehensive

   income(t,i) + common equity tier 1 minority interest includable in common equity tier 1

   capital(t,i)

   For all four items, the Board takes the value as of the effective date of the stress test

exercise from the FR Y-9C.

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[47] Board of Governors of the Federal Reserve System, 2025. *Instructions for Preparation of Consolidated Financial Statements for Holding Companies Reporting Form FR Y-9, Schedule HC-R, Part I,* https://www.federalreserve.gov/apps/reportingforms/Download/DownloadAttachment?guid=d036ea09-75d3-4f2f-8fe3-0f43c76d2f70

[48] *See* FR Y-9C, Schedule HC-R, Part I Line Item 1.

[49] *See* FR Y-9C, Schedule HC-R, Part I Line Item 2.

[50] *See* FR Y-9C, Schedule HC-R, Part I Line Item 3.

[51] *See* FR Y-9C, Schedule HC-R, Part I Line Item 4.

To project retained earnings and accumulated other comprehensive income from Equation D2, the Board adjusts the reported FR Y-9C value as of the effective date of the stress test exercise to reflect projected available supervisory stress revenue and loss model outputs for each firm i in each quarter t. For details on the formulas and assumptions the Board uses to project retained earnings, see Section C.

In the stress test scenario, increasing (decreasing) interest rate environments lead to unrealized other comprehensive income (OCI) losses (gains) in available-for-sale debt securities. As a result, for firms that include accumulated other comprehensive income in common equity tier 1 capital[52] the Capital Model sources supervisory projections of stressed, pre-tax unrealized gains (losses) on available-for-sale securities for each firm i, in each quarter t of the projection horizon from the Securities Model (see Section A in the Market Risk Models Documentation).[53] The Capital Model then calculates the quarterly change in post-tax value for inclusion in common equity tier 1 capital. For all projection quarters, accumulated other comprehensive income thus equals the previous quarter's accumulated other comprehensive income plus the quarterly change in unrealized gains (losses) on available-for-sale securities multiplied by (1 –

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[52] The regulatory capital rule requires Category I and II firms to reflect accumulated other comprehensive income within common equity tier 1 capital. Firms that are not Category I or II firms may make a one-time, permanent election to not reflect any component of accumulated other comprehensive income (with the exception of accumulated net gains and losses on cash flow hedges related to items that are not fair-valued on the balance sheet) in common equity tier 1 capital. *See* 12 CFR 217.20(b)(3); 12 CFR 217.22(b)(2); *see also* 78 FR 62018, 62058 *et seq*.

[53] For a more detailed description of the projections within the Securities Model, *see* Market Risk Models Documentation, Section A.

the supervisory tax rate).[54] The supervisory tax rate is the same as the tax rate used in the tax

expense equation of the Retained Earnings Model.[55]

Firms that include accumulated other comprehensive income (AOCI) in common equity

tier 1 capital must also reflect accumulated net gains and add (subtract) any accumulated net

losses (gains) on cash flow hedges included in AOCI that relate to the hedging of items that are

not recognized at fair value on the balance sheet.[56] Due to data availability constraints, the

Securities Model does not project this item under stress (see Section A in the Market Risk

Models Documentation). As a result, the Board assumes that this item does not impact common

equity tier 1 capital under stress and holds firm values of this item equal to values as of the

effective date of the stress test exercise.

For firms that exclude AOCI from regulatory capital, the Capital Model assigns a value

of zero to other comprehensive income for each firm i in each quarter t of the projection horizon.

In this manner, the Board holds constant the values for AOCI as reported on the FR Y-9C

Schedule HC-R (Regulatory Capital)[57] as of the effective date of the stress test exercise. As a

result, consistent with these firms' decision to exclude accumulated other comprehensive income

from regulatory capital, other comprehensive income does not impact common equity tier 1

capital for these firms in any quarter of the projection horizon.

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[54] For simplicity and consistency, the Board assumes a uniform statutory corporate tax rate of 21 percent under a single U.S. federal tax jurisdiction. Setting all firms' tax rate to 21 percent implicitly assumes no tax exclusions, deductions, or additional local taxes, and assumes that the effective rate is similar to the legally-defined corporate tax rate of 21 percent.

[55] For details on tax rate methods and assumptions, see the Unitary Tax Assumption subsection of the Retained Earnings Model, Section C.iv.b.

[56] *See* 12 CFR 217.22(b)(1)(ii).

[57] *See* FR Y-9C Schedule HC-R, Line Items 9.a–9.f.

For common stock plus related surplus and minority interest includable in common equity tier 1 capital, the Board holds constant over the projection horizon the values reported on the FR Y-9C as of the effective date of the stress test exercise. The Board finds this approach appropriate for the following reasons. First, stress test capital action assumptions dictate that covered firms will not (1) pay any dividends on any instruments that qualify as common equity tier 1 capital, (2) redeem or repurchase any capital instrument that is eligible for inclusion in the numerator of a regulatory capital ratio, or (3) issue common or preferred stock.[58] Second, firm business decisions and strategy generally drive changes to both items, which makes them difficult to model across firms independently and consistently. Third, although firm-provided projections of each item are available on the FR Y-14A, Schedule A (Summary) schedule, any use of firm-provided projections carries the disadvantage that Category IV firms generally do not submit this schedule. As a result, use of such data would produce inconsistent projections across firms. Holding projection values constant with the value reported for the effective date of the stress test exercise is thus the most consistent and comparable approach.[59] This approach also aligns with the principle of simplicity articulated in the Board's Stress Testing Policy Statement.

b. *Common Equity Tier 1 Capital Adjustments and Deductions*

Under the capital rule, firms must deduct the following items from common equity tier 1 capital before making further adjustments and deductions:[60] goodwill,[61] intangible assets,[62]

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[58] *See* 12 CFR 252.44(c); *see also* 86 FR 7927.

[59] *See* 12 CFR 252, Appendix B; *see also* 84 FR 6668; 85 FR 15576; 86 FR 7927.

[60] *See* 12 CFR 217.22; FR Y-9C, Schedule HC-R, Part I; *see also* 78 FR 62055.

[61] *See* FR Y-9C, Schedule HC-R, Part I, Line Item 6.

[62] *See* FR Y-9C, Schedule HC-R, Part I, Line Item 7.

deferred tax assets that arise from net operating loss and tax credit carryforwards,[63] accumulated

other comprehensive income-related adjustments,[64] other deductions from (additions to)

common equity tier 1 capital[65] and non-significant investments in the capital of unconsolidated

financial institutions in the form of common stock that exceed the 10 percent threshold for non-

significant investments.[66] Consistent with the capital rule, the Capital Model deducts these items

from the supervisory projection of common equity tier 1 capital before adjustments and

deductions, as defined in Section D.iii.a and Equation D2 above,[67] for each firm i in each quarter

t of the projection horizon.

          As part of covered firms' tax expenses and benefits, the Board seeks to simulate deferred

tax assets from net operating losses. For all firms, the Capital Model sources starting deferred

tax assets that arise from net operating loss and tax credit carryforwards directly from the FR Y-

9C, as of the effective date of the stress test exercise, and projection values from the Retained

Earnings Model, as described in Section C.

          For firms not subject to the Global Market Shock, the Capital Model sources values for

goodwill, intangible assets, accumulated other comprehensive income-related adjustments,[68]

non-significant investments in the capital of unconsolidated financial institutions in the form of

common stock, and other deductions from (additions to) common equity tier 1 capital[69] directly

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[63] *See* FR Y-9C, Schedule HC-R, Part I, Line Item 8.

[64] As defined in FR Y-9C, Schedule HC-R, Part I, Line Items 9.a–9.e for AOCI opt-out firms, and Line Item 9f for firms that include AOCI in capital.

[65] *See* FR Y-9C, Schedule HC-R, Part I Line Item 10.

[66] *See* 12 CFR 217.22(c)(5); *see also* 78 FR 62018, 62066. The non-significant investment adjustment only applies to Category I and II firms.

[67] *See* FR Y-9C, Schedule HC-R, Part I Line Item 5.

[68] As defined in FR Y-9C, Schedule HC-R, Part I, Line Item 9.

[69] *See* FR Y-9C, Schedule HC-R, Part I, Line Item 10.

from the FR Y-9C as of the effective date of the stress test exercise for each firm *i*, and holds this

value constant for all projection quarters *t*, without adjustment. This projection approach reflects

that the Board does not incorporate changes to a firm's business plan[70] and the Board's

assumption that a firm's standardized risk-weighted assets remain unchanged over the planning

horizon[71] in the supervisory stress test.

For firms subject to the Global Market Shock, the Capital Model applies the same data

sourcing and projection approach for intangible assets and accumulated other comprehensive

income-related adjustments as it does for firms not subject to the Global Market Shock.

Similarly, for goodwill, other deductions from (additions to) common equity tier 1 capital, and

non-significant investments in the capital of unconsolidated financial institutions in the form of

common stock,[72] the Capital Model applies the same data sourcing approach for firms subject to

the Global Market Shock as it does for firms not subject to the global market shock. However,

the projection approach for these items differs. Specifically, for each firm *i* subject to the Global

Market Shock in each projection quarter *t*, the value of each item is set equal to the FR Y-14A

firm-reported Global Market Shock-impacted value.[73] The adjustment to these items reflects the

fact that the adverse impact of the Global Market Shock is already captured on the relevant

portfolios by stress loss projections. The adjustment thus prevents the capital calculation from

reducing capital for losses that have already been recognized in net income, providing

consistency between stress loss projections and stress capital deductions.

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[70] *See* 12 CFR 252.44(a)(3); *see also* 86 FR 7927.

[71] *See* 12 CFR Part 252, Appendix B, part 3.4; *see also* 84 FR 6668; 85 FR 15576; 86 FR 7927.

[72] *See* 12 CFR 217.22(c)(5); *see also* 78 FR 62018, 62066. The non-significant investment adjustment only applies to Category I and Category II firms.

[73] Deduction item values inclusive of global market shock impacts are reported on the FR Y-14A Summary Schedule by Category I–III firms.

The following equation defines the Global Market Shock adjustment that applies to supervisory projections of goodwill, other deductions from (additions to) common equity tier 1 capital, and non-significant investments in the capital of unconsolidated financial institutions in the form of common stock. The Global Market Shock adjustment can be expressed as:

Equation D3 – Global Market Shock Adjustment

Deduction item (t,i) = Deduction item (t=0,i) – [(Deduction item (t=0,i) – Deduction item inclusive of Global Market Shock impacts reported in the FRY-14A(t=0,i))]

To determine whether a firm's non-significant investments in the capital of unconsolidated financial institutions in the form of common stock exceeds the 10 percent threshold for non-significant investments, the Capital Model sources values for non-significant investments in the capital of unconsolidated financial institutions in the form of common stock[74] directly from the FR Y-14Q as of the effective date of the stress test exercise. It also sources values for aggregate non-significant investments in the capital of unconsolidated financial institutions—which includes investments in the form of common stock, additional tier 1 capital, and tier 2 capital—from the FR Y-14Q as of the effective date of the stress test exercise. As mentioned above, for firms subject to the Global Market Shock, the Capital Model applies the shock adjustment to both non-significant investment item values before calculating deductions.

The capital rule defines the deduction threshold for non-significant investments as 10 percent of common equity tier 1 capital as defined in equation (2) after adjustments for goodwill, intangible assets, deferred tax assets that arise from net operating loss and tax credit

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[74] *See* 12 CFR 217.22(c)(5); *see also* 78 FR 62018, 62066. The non-significant investment adjustment only applies to Category I and Category II firms.

carryforwards, accumulated other comprehensive income-related adjustments and other deductions from (additions to) common equity tier 1 capital.

Equation D4 – Common Equity Tier 1 Deduction Threshold for Non-Significant Investments

Common Equity Tier 1 Deduction Threshold for Non-Significant Investments = Common equity tier 1 capital before adjustments and deductions(t,i) – goodwill(t,i) – intangible assets(t,i) – deferred tax assets that arise from net operating loss and tax credit carryforwards (t,i) – accumulated other comprehensive income-related adjustments(t,i) – other deductions from (additions to) common equity tier 1 capital(t,i)

Consistent with the capital rule,[75] the Capital Model then calculates the required deduction by first determining the aggregate non-significant investments in the capital of unconsolidated financial institutions that exceed the 10 percent deduction threshold; and then multiplies this value by the ratio of non-significant investments in the capital of unconsolidated financial institutions in the form of common stock to aggregate non-significant investments in the capital of unconsolidated financial institutions.[76] In keeping with the capital rule, the Capital Model calculates the non-significant investment deduction for each firm *i* in each quarter *t* over the projection horizon as follows:

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[75] *See* 12 CFR 217.22(c)(5)(ii); *see also* 78 FR 62018.

[76] *See* 12 CFR 217.22(c)(5); *see also* 78 FR 62018; FR Y-9C instructions, Federal Reserve Board - Reporting Forms.

Equation D5 – Non-Significant Investment Deduction

Non-significant investments deducted from common equity tier 1 capital =

*Non-significant investments in the capital of unconsolidated financial institutions in the form of common stock that exceed the deduction threshold * (Non-significant investments in the capital of unconsolidated financial institutions in the form of common stock, with GMS adjustments) / (Aggregate amount of non-significant investments in the capital of unconsolidated financial institutions, with GMS adjustments)*

where:

Equation D6 – Non-Significant Investments in the Capital of Unconsolidated Financial Institutions in the Form of Common Stock that Exceed the Deduction Threshold

Non-significant investments in the capital of unconsolidated financial institutions in the form of common stock that exceed the deduction threshold =
*Aggregate non-significant investments in the capital of unconsolidated financial institutions, with GMS adjustments – 10% * Common Equity Tier 1 threshold for non-significant investments*

Finally, the Capital Model calculates common equity tier 1 capital subtotal for each firm i in each projection quarter t:

Equation D7 – Common Equity Tier 1 Capital Subtotal

Common equity tier 1 capital subtotal (t,i) = Common equity tier 1 capital before

adjustments and deductions(t,i) – goodwill(t,i) – intangible assets(t,i) – deferred tax

assets that arise from net operating loss and tax credit carryforwards (t,i) – accumulated

other comprehensive income-related adjustments(t,i) – other deductions from (additions

to) common equity tier 1 capital(t,i) – non-significant investments that exceed the 10

percent deduction threshold(t,i)[77]

The Capital Model uses the resulting common equity tier 1 capital subtotal values to

calculate threshold values for the additional threshold adjustments and deductions, described

below.

c. *Threshold Adjustments and Deductions to Common Equity Tier 1 Capital*

Under the capital rule,[78] Category I and II firms must deduct amounts of mortgage

servicing assets (MSAs),[79] temporary difference deferred tax assets that the firm could not

realize through net operating loss carrybacks (DTAs from temporary differences),[80] and

significant investments in the capital of unconsolidated financial institutions in the form of

common stock[81] (collectively, threshold items) that individually exceed 10 percent of the firm's

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[77] Under 12 CFR 217.22(c)(5), the deduction for non-significant investments that exceed the 10 percent threshold is relevant for Category I and II firms only. *See also* 78 FR 62018.

[78] *See* 12 CFR 217.22(d)(1)–(3); *see also* 78 FR 62018, 62069 *et seq*.

[79] *See* FR Y-9C, Schedule HC-R, Part I, Line Item 14(b).

[80] *See* FR Y-9C, Schedule HC-R, Part I, Line Item 15(b).

[81] *See* FR Y-9C, Schedule HC-R, Part I, Line Item 13(b). A significant investment in the capital of an unconsolidated financial institution is defined as an investment in the capital of an unconsolidated financial institution where a banking organization subject to Category I or II capital standards owns more than 10 percent of the issued and outstanding common stock of the unconsolidated financial institution.

common equity tier 1 capital subtotal as defined in Equation D7.[82] Category I and II firms must

also deduct the aggregate amount of threshold items not deducted under the 10 percent threshold

deduction but that nevertheless in aggregate exceed the firm's 15 percent common equity tier 1

capital deduction threshold, net of any 10 percent threshold deductions, as defined in Equation

D8.[83]

Under the capital rule, Category III and IV firms must deduct MSA amounts, DTAs from

temporary differences, and investments in the capital of unconsolidated financial institutions[84]

(collectively, threshold items) that individually exceed 25 percent of the firm's common equity

tier 1 capital subtotal.[85] Consistent with the capital rule, the Capital Model deducts amounts of

threshold items above the threshold limits for each firm i in each quarter t of the projection

horizon from a firm's common equity tier 1 capital subtotal as defined in Equation D6 above.

The Capital model thus defines required deductions to common equity tier 1 capital for

Category I and II firms and Category III and IV firms, subject to the 10% or 25% deduction

threshold, respectively, as:

Equation D8 – Deduction Required for 10% Deduction Threshold for Category I and II Firms

Deduction required for 10% deduction threshold(t,i) = Deduction item(t,i) – 10%

*(Common equity tier 1 capital subtotal(t,i))

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[82] *See* 12 CFR 217.22(d)(2)(i); *see also* 78 FR 62018.

[83] *See* 12 CFR 217.22(d)(2)(ii). *See also* FR Y-9C, Schedule HC-R, Part I Line Item 11.

[84] *See* 12 CFR 217.22(c)(4). For banking organizations that are not subject to Category I or II capital standards, the capital rule does not have distinct treatments for significant and non-significant investments in the capital of unconsolidated financial institutions. Rather, the regulatory capital treatment for an investment in the capital of unconsolidated financial institutions would be based on the type of instrument underlying the investment.

[85] *See* 12 CFR 217.22(c)(4) and 12 CFR 217.22(d)(1); *see also* 78 FR 62018.

Equation D9 – Deduction Required for 25% Deduction Threshold for Category III and IV Firms

Deduction required for 25% deduction threshold(t,i) = Deduction item(t,i) – 25%

*(Common equity tier 1 capital subtotal(t,i))

where:

- The Capital Model applies Equation D8 to significant investments in the capital of unconsolidated financial institutions in the form of common stock, mortgage servicing assets and deferred tax assets from temporary differences.
- The Capital Model applies Equation D9 to investments in the capital of unconsolidated financial institutions, mortgage servicing assets and deferred tax assets from temporary differences.

To determine whether a threshold item individually (or in aggregate, if applicable) must be removed from common equity tier 1 capital, the Capital Model sources the gross value of MSA amounts and of deductions due to insufficient additional tier 1 and tier 2 capital as of the effective date of the stress test exercise from the FR Y-9C. The Capital Model then holds these values constant for each firm *i* in each quarter *t* over the projection horizon, without adjustment. This projection approach provides the simplest way to reflect both the deduction mechanics outlined in the capital rule, as well as the stress test no business plan change[86] assumption and the assumption that a covered company's risk-weighted assets remain unchanged over the planning horizon, except for changes associated with the calculation of regulatory capital or changes to the Board's regulations in the calculation of risk-weighted assets (flat balance sheet assumption).[87]

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[86] *See* 12 CFR 252.44(a)(3); *see also* 86 FR 7927.

[87] *See* 12 CFR Part 252, Appendix B, Section 3.4; *see also* 84 FR 6668, note 10; 85 FR 15576, 15605; 86 FR 7927, 7949. Under the Policy Statement, this assumption ensures that a firm cannot "shrink to health" and serves the Board's goal of helping to assure that the firm remains sufficiently capitalized to accommodate credit demand in a severe downturn. This assumption also allows supervisors to evaluate the health of the banking sector since the supervisory stress test contemplates that each firm continues to lend during times of economic stress. In addition, by precluding the need to make assumptions regarding how underwriting standards might tighten or loosen across

For Category I and II firms subject to the Global Market Shock, the Capital Model

adjusts values of significant investments in the capital of unconsolidated financial institutions in

the form of common stock as of the effective date, for all quarters t over the projection horizon to

reflect the FR Y-14Q firm-reported value after accounting for the impact of the global market

shock in quarter $t=0$, as reported by the firms on the FR Y-14A and expressed in Equation D3.[88]

For Category III or IV firms subject to the Global Market Shock, the Capital Model adjusts

values of investments in the capital of unconsolidated financial institutions as of the effective

date, for all quarters t over the projection horizon to reflect the FR Y-14Q firm-reported value

after accounting for the impact of the global market shock in quarter $t=0$, as reported by the

firms on the FR Y-14A and expressed in Equation D3.[89] The Capital Model then holds shocked

values of significant investments in the capital of unconsolidated financial institutions in the

form of common stock and investments in the capital of unconsolidated financial institutions, flat

for each firm i in each quarter t over the projection horizon. The Global Market Shock

adjustment to these items reflects the fact that the adverse impact of the Global Market Shock on

the relevant portfolios is already captured in stress loss projections. It also reflects the fact that

the Global Market Shock only impacts losses in the first quarter of the projection horizon.

For Category I and II firms not subject to the Global Market Shock, the Capital Model

holds the reported values for significant investments in the capital of unconsolidated financial

institutions in the form of common stock as of the effective date of the stress test exercise

constant for each firm i in each quarter t over the projection horizon, without adjustment. For

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individual firms during times of economic stress, the Capital Model promotes consistency across firms, in
accordance with the Policy Statement.

[88] The adjustments are reported on the FR Y-14A by the firms.

[89] The adjustments are reported on the FR Y-14A by the firms.

Category III and IV firms not subject to the Global Market Shock, the Capital Model also holds

the reported values for investments in the capital of unconsolidated financial institutions as of the

effective date of the stress test exercise constant for each firm i in each quarter t over the

projection horizon, without adjustment. Values for both significant investments in the capital of

unconsolidated financial institutions in the form of common stock, and investments in the capital

of unconsolidated financial institutions, are sourced from the FR Y-14Q as of the effective date

of the stress test exercise. This projection approach reflects the fact that these firms are not

subject to the Global Market Shock, as well as the no business plan change[90] and flat balance

sheet[91] assumptions in the stress test.

The capital rule requires firms to deduct DTAs arising from temporary differences net of

related valuation allowances and net of deferred tax liabilities.[92] The Capital Model sources

starting values of deferred tax assets from temporary differences, net of deferred tax liabilities,

and values of deferred tax assets from temporary differences, net of deferred tax liabilities and

valuation allowance, from the FR Y-14Q[93] as of the effective date of the stress test exercise. The

Capital Model sources projection values for each firm i in each projection quarter t from the

Retained Earnings Model projections of DTAs from temporary differences, as described in

Section C.iii.e. The Capital Model then adjusts these quarterly projections for each firm using

the valuation allowance, as calculated for each firm i in each quarter t in the Retained Earnings

Model. Firms can also use deferred tax assets to reduce quarterly taxes payable set aside for a

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[90] *See* 12 CFR 252.44(a)(3); *see also* 86 FR 7927.

[91] *See* 12 CFR 252, part 2.7, Appendix B; *see also* 84 FR 6668; 85 FR 15576; 86 FR 7927.

[92] *See* 12 CFR 217.22(d)(1)(ii) and (d)(2)(i)(A); *see also* 78 FR 62018.

[93] *See* FR Y-14Q, Schedule D.

given year;[94] to reflect this, the Capital Model reduces deferred tax assets from temporary

differences by positive values of taxes payable. The Capital Model thus adjusts projections to

reflect the fact that firms can use deferred tax assets to reduce tax withholdings even in a year

where the firm experiences net operating losses overall. Finally, the capital rule permits firms to

net deferred tax liabilities against assets subject to deduction.[95] In some cases, deferred tax

liabilities may exceed deferred tax assets such that the firm is in a net deferred tax liability

position as of the effective date of the stress test exercise. In these cases, a firm may report a

negative net deferred tax asset starting value as of the effective date of the stress test, and the

Capital Model holds this negative value flat for each firm i and adds it to the net number in each

quarter t of the projection horizon. This recognizes a firm's actual netting of deferred tax

liabilities without making additional assumptions regarding any changes to the deferred tax

liability position during the projection horizon. The Capital Model then uses this final adjusted

value for net deferred tax assets from temporary differences subject to threshold deduction.

 Under the capital rule, Category I and II firms must also adjust common equity tier 1

capital for items that are not deducted as a result of the individual 10 percent common equity tier

1 capital deduction threshold, but that in aggregate exceed 17.65 percent of common equity tier 1

capital net of amounts deducted as a result of the 10 percent common equity tier 1 capital

deduction threshold ("15 percent threshold deductions").[96]

 The Capital Model calculates gross projection values for fifteen-percent threshold

deductions by aggregating individual projection values for significant investments in the capital

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[94] Tax Cuts and Jobs Act of 2017, Public Law 115-97, 131 Stat. 2054 (2017).

[95] *See* 12 CFR 217.22(e); *see also* 78 FR 62018.

[96] *See* 12 CFR 217.22(d)(2)(ii); *see also* 78 FR 62018.

of unconsolidated financial institutions in the form of common stock, mortgage servicing assets,

and deferred tax assets from temporary differences for each Category I and II firm i in each

projection quarter t of the projection horizon. This approach ensures that supervisory projections

consistently reflect the flat balance sheet assumption and no business plan change assumptions,

while at the same time incorporating Global Market Shock impacts to capital deduction items

where relevant. The Capital Model then removes already deducted amounts and compares the

remainder with common equity tier 1 subtotal, using the following formula:

Equation D10 – 15% Threshold Deductions

15 percent threshold deductions =

(Sum of items subject to the 10% deduction threshold) – 17.65% * (Common equity tier

1 subtotal – Sum of deductions required for the 10% deduction threshold)

where:

- *Sum of items subject to the 10% deduction threshold* represents the sum of a firm's total significant investments in the capital of unconsolidated financial institutions in the form of common stock, mortgage servicing assets and deferred tax assets from temporary differences
- *Common equity tier 1 subtotal* is calculated as defined in Equation D7
- *Sum of deductions required for the 10% deduction threshold* are defined as the sum of deductions as defined in Equation D8.

Table D1 summarizes the treatment of Capital Model regulatory capital deductions and

their sources:

Table D1 – Treatment of Key Regulatory Capital Deductions and Adjustments

Item/Description	Treatment	Source
Additional tier 1 capital deductions	Held constant	FR Y-9C
All other deductions from (additions to) CET1 capital before threshold-based deductions	Held constant[1]	FR Y-9C
AOCI-related adjustments	Held constant	FR Y-9C
Deductions applied to CET1 capital due to insufficient amounts of additional tier 1 capital and tier 2 capital to cover deductions	Held constant	FR Y-9C
DTAs arising from temporary differences that could not be realized through NOL carrybacks, net of related valuation allowance and net of DTLs	Supervisory projections	FR Y-14Q, FR Y-14A
DTAs from NOLs and tax credit carryforwards, net of any related valuation allowances and net of DTLs	Supervisory projections	FR Y-14Q
Goodwill, net of associated DTLs	Held constant[1]	FR Y-9C
Intangible assets (other than goodwill and mortgage servicing assets), net of associated DTLs	Held constant	FR Y-9C
Mortgage servicing assets, net of associated DTLs	Held constant	FR Y-14Q
Non-significant investments in the capital of unconsolidated financial institutions in the form of common stock	Held constant[1, 2]	FR Y-14Q
Significant investments in the capital of unconsolidated financial institutions in the form of common stock	Held constant[1, 2]	FR Y-14Q
Tier 2 capital deductions	Held constant	FR Y-9C
Investments in the capital of unconsolidated financial institutions	Held constant[3]	FR Y-14Q
Unrealized net gain (loss) related to changes in the fair value of liabilities that are due to changes in credit risk	Held constant	FR Y-9C
Income attributable to minority interest	Supervisory projections	FR Y-9C

[1] Certain items are adjusted to reflect the effect of the global market shock using data reported on the FR Y-14A.
[2] Item only applies to Category I–II firms.
[3] Item only applies to Category III–IV firms.

d. Risk-Weighted Assets

Consistent with the Board's enhanced prudential standards rule,[97] the stress test

calculates total risk-weighted assets[98] for each firm i in each quarter t of the projection horizon

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[97] The Board's Regulation Y specifies that post-stress regulatory capital ratios must not use advanced approaches. *See* 12 CFR 225.8(d)(17); *see also* 85 FR 15576.

[98] For standardized risk-weighted assets, the capital rule requires a firm to calculate its risk-weighted asset amounts for its on- and off-balance sheet exposures and, for firms subject to market risk capital requirements, standardized market risk assets as determined under subpart F. Risk-weighted asset amounts generally are determined by assigning on-balance sheet assets to broad risk-weight categories according to the counterparty, or, if relevant, the guarantor or collateral. Similarly, risk-weighted asset amounts for off-balance sheet items are calculated using a two-step process: (1) Multiplying the amount of the off-balance sheet exposure by a credit conversion factor (CCF) to determine a credit equivalent amount, and (2) assigning the credit equivalent amount to a relevant risk-weight category. *See* 12 CFR part 217, subparts D and F; *see also* 78 FR 62018.

using standardized total risk-weighted assets as defined in the capital rule.[99] As a result, the

Capital Model sources starting risk-weighted asset components as of the effective date of the

stress test exercise using the amounts included within each firm's standardized total risk-

weighted assets. Furthermore, consistent with the Board's Stress Testing Policy Statement,[100]

the stress test assumes that in a hypothetical stress event, a firm takes actions to maintain its

current level of assets, including its securities, trading assets, and loans. Although a firm's

balance sheet may change in different ways in periods of stress, a constant balance sheet

assumption simplifies the Board's stress testing framework, while dissuading firms from

planning to reduce credit supply in a stress scenario.

Accordingly, the Capital Model generally assumes that a firm's risk-weighted assets

remain unchanged over the projection horizon (flat balance sheet assumption), except for

changes primarily related to deductions from regulatory capital or due to changes to the Board's

regulations. To calculate standardized total risk-weighted assets,[101] the Capital Model sources

values as of the effective date of the stress test exercise from the FR Y-9C[102] for each firm *i* and

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[99] The capital rule defines standardized total risk-weighted assets as (1) the sum of (i) total risk-weighted assets for general credit risk as calculated under 12 CFR 217.31; (ii) total risk-weighted assets for cleared transactions and default fund contributions as calculated under 12 CFR 217.35; (iii) total risk-weighted assets for unsettled transactions as calculated under 12 CFR 217.38; (iv) total risk-weighted assets for securitization exposures as calculated under 12 CFR 217.42; (v) total risk-weighted assets for equity exposures as calculated under 12 CFR 217.52 and 217.53; and (vi) for a market risk Board-regulated institution only, standardized market risk-weighted assets; minus (2) Any amount of the Board-regulated institution's allowance for loan and lease losses or adjusted allowance for credit losses, as applicable, that is not included in tier 2 capital and any amount of "allocated transfer risk reserves." *See* 12 CFR 217.2, Standardized total risk-weighted assets; *see also* 78 FR 62018.

[100] 12 CFR 252, Appendix B, part 3.4; *see also* 84 FR 6668, note 10; 85 FR 15576, 15605; 86 FR 7927, 7949.

[101] Other on-balance sheet, non-loan asset exposures do not use this approach. The approach applied to these exposures is described below, in Section D.iii.d(1).

[102] The Capital Model sources certain risk-weighted asset values from the Balances model, which calculates starting values directly using exposure amounts and relevant risk weights as reported on the FR Y-9C. The Balances Model then aggregates items based on category as per the FR Y-9C instructions and form, and holds these values flat over the projection horizon. *See* Balances Model (Section A) for more information.

then multiplies the sourced values by the risk weight applicable to each balance sheet asset

category, consistent with FR Y-9C, Schedule HC-R (Regulatory Capital).[103] In accordance with

the flat balance sheet assumption, the Capital Model generally holds these values constant over

the projection horizon, except for common equity tier 1 threshold deduction items described in

the *Common Equity Tier 1 Capital Adjustments and Deductions* section (see Section D.iii.b).

The Board's Stress Testing Policy Statement[104] also states that when projecting a firm's

risk-weighted assets in the hypothetical stress event, the Board will account for the effect of

changes associated with the calculation of regulatory capital. The Board does this by adjusting

risk-weighted assets for the projections of items described in *Common Equity Tier 1 Capital*

Adjustments and Deductions and Threshold Adjustments and Deductions to Common Equity Tier

1 Capital.[105] (*See* sections D.iii.b and D.iii.c.)

(1)   Other On-Balance Sheet, Non-Loan Asset RWAs

To ensure that that risk-weighted assets calculations appropriately exclude amounts

deducted from common equity tier 1 over the course of the projection horizon, the Capital Model

adjusts the values for other on-balance sheet, non-loan asset exposures as of the effective date of

the stress test exercise using the equation below.

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[103] For additional information on the calculation and data sourcing for risk-weighted assets before deductions for excess allowance and allocated risk transfer reserve, *see* Balances Model in Section A.

[104] 12 CFR 252, Appendix B, part 3.4(b); *see also* 84 FR 6668, note 10; 85 FR 15576, 15605; 86 FR 7927, 7949.

[105] This includes RWAs from excess allowance.

Equation D11 – Other on Balance Sheet, Non-loan Asset Risk Weighted Assets

Other on-balance sheet, non-loan asset risk-weighted assets(t,i) = Other on-balance

sheet, non-loan risk-weighted assets before adjustments or deductions from capital(t,i) +

Items subject to adjustment or deduction from capital(t,i)

Firms do not report disaggregated values of these exposures before adjustments or deductions from capital on the FR Y-9C. However, the Capital Model must project these items consistent with the corresponding post-stress common equity tier 1 capital component projections; it thus derives these values as of the effective date of the stress test exercise for each firm by subtracting values for risk-weighted items subject to adjustment and deductions from common equity tier 1 capital, from values of total other on-balance sheet, non-loan asset risk-weighted assets. The derived value of other on-balance sheet, non-loan risk-weighted assets is then held constant over the projection horizon for each firm *i* in each quarter *t*. The Capital Model projects this for all firms as:

Equation D12 – Other On-Balance Sheet, Non-loan Asset Risk Weighted Assets Before Adjustments or Deductions from Capital

Other On-Balance Sheet, Non-Loan Asset risk-weighted assets Before Adjustments or

Deductions from Capital(t,i] = Other On-Balance Sheet, Non-Loan Asset RWAs(t=0,i) –

Items Subject to Adjustment or Deduction from Capital(t=0,i)

The common equity tier 1 threshold deduction items that impact risk-weighted assets are the same items discussed in *Threshold Adjustments and Deductions to Common Equity Tier 1 Capital* above. Consistent with the capital rule, the Capital Model includes any amounts not

reflected within common equity tier 1 capital within a firm's risk-weighted assets by multiplying the derived value by the risk weight applicable to the exposure.

The Capital Model is generally consistent with the capital rule in that it applies (1) a 250 percent risk weight to DTAs from temporary differences, MSAs, and significant investments in the capital of unconsolidated financial institutions in the form of common stock;[106] and (2) a 100 percent risk weight to amounts of other capital deduction items included in *Threshold Adjustments and Deductions to Common Equity Tier 1 Capital* common equity tier 1 capital.[107] Unlike the capital rule, the Capital Model applies a 300 percent risk weight to non-significant investments in the capital of unconsolidated financial institutions in the form of common stock that are not reflected in common equity tier 1 capital. Under the capital rule, the risk weight applicable to these exposures can vary, depending on the materiality of the firm's aggregate equity holdings relative to its total capital.[108] As firms do not report average risk-weight for non-significant investment items on the FR Y-9C, the Board makes a simplifying assumption that assigns a 300 percent risk weight, a midpoint value given the range of options. This simple assumption is meant to minimize model complexity and data reporting burden and allows for a more straightforward interpretation of results drivers.[109]

For Category I and II firms, the Capital Model derives starting risk-weighted values for items subject to adjustment or deduction from common equity tier 1 capital, as:

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[106] *See* footnote 29 to 12 CFR 217.22(d)(1)(i); 12 CFR 217.32(l)(4) and 217.52(b)(4), footnote 31 to 12 CFR 217.22(d)(2)(ii); *see also* 78 FR 62018.

[107] *See* 12 CFR 217.22(d)(1)(ii), 12 CFR 217.32(l)(5) and 12 CFR 217.52(b)(3)(iii); *see also* 78 FR 62018.

[108] *See* 12 CFR 217.52(b)(3), 12 CFR 217.52(b)(5) and 12 CFR 217.52(b)(6); *see also* 78 FR 62018. The capital rule only requires firms to apply a 300 or 400 percent risk weight to non-significant investments in the capital of unconsolidated financial institutions to the extent that the aggregate adjusted carrying value of the exposures does not exceed 10 percent of the firm's total capital.

[109] *See* 12 CFR 252, Appendix B, part 1.4; *see also* 84 FR 6668; 85 FR 15576, 15605; 86 FR 7927, 7949.

Equation D13 – Starting Risk Weighted Values for Items Subject to Adjustment or Deduction

from Capital for Category I and II Firms

Items Subject to Adjustment or Deduction from Capital(i,t=0) =

(300% Risk Weight) *

[Gross Non-Significant Investments(i,t=0) – Non-Significant Investments

deduction(i,t=0)] +

(250% Risk Weight) *

[Gross Investments in the Capital of Unconsolidated Financial Institutions(i,t=0) –

Investments in the Capital of Unconsolidated Financial Institutions, deducted from

capital(i,t=0)) + (Gross MSAs(i,t=0) – MSAs, deducted from capital(i,t=0)) + (Gross

DTAs from Timing(i,t=0) – DTAs from Timing, deducted from capital(i,t=0) –

Additional Deduction Items, deducted from capital(i,t=0)]

For Category III and IV firms, the Capital Model derives starting risk-weighted values for items subject to adjustment or deduction from common equity tier 1 capital as:

Equation D14 – Starting Risk Weighted Values for Items Subject to Adjustment or Deduction

from Capital for Category III and IV Firms

Items Subject to Adjustment or Deduction from Capital(i,t=0) =

*(100% Risk Weight) * [((Gross Investments in the Capital of Unconsolidated Financial*

Institutions(i,t=0) - Investments in the Capital of Unconsolidated Financial Institutions,

deducted from capital(i,t=0))

*+ (250% Risk Weight) * [(Gross MSAs(i,t=0) – MSAs, deducted from capital(i,t=0) +*

(Gross DTAs from Timing(i,t=0) - DTAs from Timing, deducted from capital(i,t=0)]

*+ (100% Risk Weight) * [(DTAs from NOL(i,t=0)]*

As previously discussed, the Capital Model sources starting values of items subject to

adjustment or deduction from capital as of the effective date of the stress test exercise from the

FR Y-9C and FR Y14Q. The Capital Model then adjusts these values for each firm *i* over the

course of the projection horizon by projected changes in items subject to adjustment or deduction

from common equity tier 1 capital. These changes include: adjustments over the projection

horizon to capital deductions from the global market shock (see Section D.iii.b); and changes in

values of deferred tax assets from net operating losses (see Section C).[110] As the adjustments or

deductions to common equity tier 1 capital differ depending on a firm's category, the Capital

Model similarly contains different methods for estimating risk-weighted assets for these

exposures in each quarter *t* in the projection horizon for Category I and II firms and for Category

III and IV firms.

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[110] For a full list of items subject to adjustment and deduction in capital and their calculation in risk-weighted assets,
see Section D.iii.d(1).

For Category I and II firms, risk-weighted assets for items subject to adjustment or deduction from common equity tier 1 capital for each quarter t in the projection horizon are defined as follows:

Equation D15 – Risk Weighted Assets for Items Subject to Adjustment or Deduction from Common Equity Tier 1 Capital for Category I and II Firms

Items Subject to Adjustment or Deduction from Capital(i,t) =

*(300% Risk Weight) * [Gross Non-Significant Investments(i,t) – Non-Significant Investments deduction(i,t)]*

*+ (250% Risk Weight) * [(Gross Investments in the Capital of Unconsolidated Financial Institutions(i,t) – Investments in the Capital of Unconsolidated Financial Institutions, deducted from capital(i,t)) + (Gross MSAs(i,t) – MSAs, deducted from capital(i,t)) + (Gross DTAs from Timing(i,t) - DTAs from Timing, deducted from capital(i,t)) – Additional Deduction Items, deducted from capital(i,t)))*

+ (100% Risk Weight)[Goodwill(i,t—t=0) + DTAs from NOL(i,t—t=0) + Other deductions from CET1(i,t—t=0)]

For Category III and IV firms, risk-weighted assets for items subject to adjustment or deduction from common equity tier 1 capital for each quarter t in the projection horizon are defined as follows:

Equation D16 – Risk Weighted Assets for Items Subject to Adjustment or Deduction from

Common Equity Tier 1 Capital for Category III and IV Firms

Items Subject to Adjustment or Deduction from Capital(i,t) =

*(100% Risk Weight) * [((Gross Investments in the Capital of Unconsolidated Financial*

Institutions(i,t) - Investments in the Capital of Unconsolidated Financial Institutions,

deducted from capital(i,t))

*+ (250% Risk Weight) *[(Gross MSAs(i,t) – MSAs, deducted from capital(i,t)) + (Gross*

DTAs from Timing(i,t) - DTAs from Timing, deducted from capital(i,t))]

*+ (100% Risk Weight) * [(DTAs from NOL(i,t—t=0)]*

(2)   Excess Allowance

Consistent with the capital rule, the Capital Model subtracts the amount of credit loss

allowance that is not includable in tier 2 capital (excess allowance)[111] from standardized total

risk-weighted assets.[112] The Capital Model calculates excess allowance for each firm *i* in each

quarter *t* as:

Equation D17 – Excess Allowance

(12)   *Excess Allowance(i,t) = Credit Loss Allowance(i,t) – Allocated Transfer Risk*

Reserve included in ALLL(i,t) – Credit Loss Allowance includable in tier 2 capital(i,t)

where

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[111] Tier 2 capital includes Allowance for Loan and Lease Losses equal to or less than 1.25 percent of risk-weighted assets. *See* 12 CFR 217.20(d)(3); *see also* 78 FR 62018.

[112] *See* 12 CFR 217.2, Standardized total risk-weighted assets; *see also* 78 FR 62018.

- *Credit Loss Allowance includable in tier 2 capital (i,t)* equals the minimum of [Credit Loss Allowance(i,t) minus Allocated Transfer Risk Reserve included in ALLL(i,t)], and 1.25 percent of risk-weighted assets for purposes of calculating the allowance for loan and lease losses threshold.[113] The Capital Model defines risk-weighted assets for purposes of calculating the allowance 1.25 percent threshold as risk-weighted assets before deductions for excess allowance of loan and lease losses and allocated risk transfer reserve plus items subject to adjustment and deduction in capital.

Values as of the effective date of the stress test exercise for allocated transfer risk reserve included in allowance for loan and lease losses are sourced from the FR Y-9C[114] and held constant over the projection horizon. The credit loss allowance projection values for each firm *i* in each quarter *t* of the projection horizon are provided by the output from the Provisions Model. For more detail on the Provisions Model methodology, please see Section B.

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iv.   Alternative Variable Sourcing for the Capital Model

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Rather than holding items for adjustment and deduction in capital constant with their values as of the effective date of the stress test exercise, the Capital Model could instead source these directly from individual, firm-provided projections reported on the FR Y-14A Schedule A (Summary) schedule. However, the use of firm projections would imply differential treatment across covered firms, because only Category I, II, and III firms are required to report this data on the FR Y-14A. Moreover, such an approach would create an internal inconsistency within supervisory stress projections, because individual firm-reported paths rely on firms' own revenue and loss projections under the severely adverse scenario. Furthermore, explaining deduction and adjustment paths would also be difficult given that these were not determined by supervisory models, and conducting quality assurance would be difficult given the various drivers of

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[113] "RWAs for purposes of calculating the allowance for loan and lease losses 1.25 percent threshold," FR Y-9C HC-R. II line 26.

[114] *See* FR Y-9C, Schedule HI-B, Memo item.

difference between the Board and the firms' models. Finally, the direct use of individual, firm-specific projections deviates from the Board's principle of independence, as articulated in the Stress Testing Policy Statement.[115]

Rather than assuming the risk weights for non-significant investments, the Capital Model could source exposure and risk-weight data from the FFIEC 101 Schedule R (Equity Exposures) to calculate a weighted average risk weight for each firm as of the effective date of the stress test exercise. These risk weights could be calculated specifically for each firm and then held constant over the projection horizon. This approach would still be relatively simple and leverage available data; however, based on the Board's evaluation of recent data, smaller risk weights increase capital declines whereas larger risk weights decrease them. As a result, given that reported data generally indicates an average risk weight below 300 percent, this adjusted approach would likely increase the severity of capital declines relative to the current approach.

v.   Questions

The Board seeks comment on:

Question D1: What alternative options should the Board consider in place of holding capital adjustment or deduction items constant over the course of the projection horizon? What would be the advantages and disadvantages of using alternative calculations to estimate changes in items for adjustment and deduction in capital, and what would be the justification for doing so?

Question D2: Should the Board consider adding or removing, or disaggregating or aggregating any variables from the Capital Model? If so, which variables? What would be the

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[115] *See* 12 CFR 252, Appendix B, part 1.1; *see also* 84 FR 6668; 85 FR 15576; 86 FR 7927.

advantages and disadvantages of adding or removing or aggregating or disaggregating those variables?

Question D3: Are there additional data items reported on the FR Y-9C or FR Y-14 forms that the Board should consider incorporating in its modeling of common equity tier 1 ratios? If so, which ones? What would be the advantages and disadvantages of such additional data items?

Question D4: What are the advantages and disadvantages to using a 300 percent risk-weight to non-significant investments assumption to model common equity tier 1 ratios in the supervisory stress test? Should the Board consider modifying the 300 percent risk-weight to non-significant investments assumption and instead use available data to estimate a firm-specific risk weight? If the Board were to change this assumption, how should the Board address data limitation concerns? What would be the advantages and disadvantages of that change?

Question D5: Are there aspects of applicable tax laws that could impact how the Board calculates regulatory capital, which are not currently being taken into account, and which should be incorporated into the calculation? If so, what are they, and how should the Board consider incorporating these changes in its regulatory capital calculations? What would be the advantages and disadvantages of such changes?